

Rapid Assessment Report for Site 36, Building NS26

Zone I Charleston Naval Complex

North Charleston, South Carolina



Southern Division Naval Facilities Engineering Command

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RAPID ASSESSMENT REPORT FOR SITE 36, BUILDING NS26

ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

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CERTIFICATION PAGE

I certify that the information contained in this report and on any attachments is true, accurate, and complete to the best of my knowledge, information, and belief.

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SCDHEC UST Site Rehabilitation Contractor Class I & II No. 24

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EXECUTIVE SUMMARY

Tetra Tech NUS, Inc. (TtNUS) has completed a Rapid Assessment (RA) for Site 36 which includes a former underground storage tank (UST) system for Building NS26 at Charleston Naval Complex (CNC) Zone I, in North Charleston, South Carolina. The UST provided storage for used oil. The RA was performed under the direction of the South Carolina Department of Health and Environmental Control (SCDHEC).

TtNUS performed the following actions during the RA:

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, to evaluate public and private potable wells, to locate utility line areas, to locate nearby surface water bodies, and to determine surface hydrology and drainage;
- Reviewed the previously prepared Underground Storage Tank Assessment Report for UST NS26 to determine boring locations and monitoring well placements;
- Conducted site survey to identify utilities and to construct a site plan;
- Performed direct push investigation, and collected soil and groundwater samples for field screening of total petroleum hydrocarbons using an organic vapor analyzer;
- Collected groundwater samples from direct push borings for mobile laboratory screening analysis for benzene, toluene, ethylbenzene, and total xylenes (BTEX); and diesel range organics;
- Installed three temporary piezometers during the direct push investigation;
- Installed six shallow permanent monitoring wells (Type II) to approximately 14 feet below land surface (bls) and a one vertical delineation well (Type III) to approximately 36 feet bls;
- Installed two permanent piezometers;
- Collected groundwater samples from the permanent monitoring wells for laboratory analysis for BTEX, methyl tert-butyl ether (MTBE), and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260 and polynuclear aromatic hydrocarbons (PAHs) using USEPA Method 8270, and metals using USEPA Method 3050B;
- Collected soil samples for laboratory analysis for BTEX and naphthalene using USEPA
 Method 8260, PAHs using USEPA Method 8270, total organic carbon (TOC) using
 USEPA Method 415.1, total recoverable petroleum hydrocarbons (TRPH) using USEPA
 Method 9071, and grain size analysis using sieve and hydrometer methods; and

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 Surveyed monitoring well and piezometer top of casing elevations and collected depth to groundwater measurements to evaluate the groundwater flow direction.

Conclusion

Groundwater elevations were recorded in each well on September 10, 1999. Free product (thickness = 0.05 foot) was detected in piezometer CNC36-P03. Free product was not detected in any of the remaining wells or other piezometer. Groundwater samples were collected on September 10-13, 1999, and shipped to a fixed-base laboratory for analysis. Naphthalene was the only chemical of concern (CoC) detected at a concentration exceeding the SCDHEC Risk Based Screening Level (RBSL) in two samples (CNC36-M01 = 110 μ g/L; CNC36-M04 = 13 μ g/L). All other groundwater analyte concentrations were below the RBSL or the laboratory reporting detection limit.

Seven environmental soil samples and one duplicate sample were collected on September 21-23, 1999, and analyzed for BTEX and PAHs by a fixed-base laboratory. Naphthalene soil concentrations exceeding the SCDHEC RBSL for sand-rich soils were reported in two samples (CNC36-B05 = $4,582~\mu g/kg$; CNC36-B06 = $48,000~\mu g/kg$). The laboratory detection limit for benzene exceeded the RBSL for soil boring CNC36-B06; therefore, the soil concentration for benzene was presumed greater than the RBSL. All other soil analyte concentrations were below the RBSL.

Construction worker and Cooper River site-specific target levels (SSTLs) were calculated to evaluate the exposure pathways for soil and groundwater CoCs. The concentration of benzene in the soil exceeds the calculated minimum SSTL, and the concentrations of benzene and naphthalene in groundwater exceed the calculated minimum SSTLs. These soil and groundwater concentrations may pose a threat to construction workers in nearby utility trenches and the Cooper River.

Recommendation

Because concentrations in the groundwater and soil exceed the minimum calculated SSTLs protective of a construction worker in a utility trench and the Cooper River, the Author recommends preparing an active Corrective Action Plan.

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1.0 INTRODUCTION

Site 36 contains the location of an underground storage tank (UST) system located adajcent to Building NS26 at the Charleston Naval Complex (CNC), Zone I in North Charleston, South Carolina. This Rapid Assessment (RA) was performed by Tetra Tech NUS, Inc.'s (TtNUS's) Tallahassee, Florida, office located at 1401 Oven Park Drive, Suite 102, Tallahassee, Florida, 32308 (telephone number 850-385-9899) on behalf of the U.S. Navy Southern Division (SOUTHDIV) Naval Facilities Engineering Command (NAVFAC), 2155 Eagle Drive, North Charleston, South Carolina 29406 (telephone number 843-820-7307). Authorization to conduct the RA for the Site was issued by NAVFAC under Contract Task Order (CTO) 0103. The RA was performed under the direction of the South Carolina Department of Health and Environmental Control (SCDHEC). TtNUS performed fieldwork necessary to complete the RA during June through September 1999.

1.1 SITE DESCRIPTION

The CNC is in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina (Figure 1). This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River. The site is located within the developed portion of the base as shown on Figure 2.

The area surrounding CNC is "mature urban," having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. A site vicinity map, which exhibits adjacent properties and structures, vicinity roads, current utilities, and vicinity surface drainage, is included as Figure 2.

Building NS26, a vehicle maintainence facility, was part of the Navy's Shore Intermediate Activity complex and utilized UST NS26 to temporarily store used oil. UST NS26 was a 200-gallon steel tank located adjacent to Building NS26 approximately 60 feet from the northeast corner of the building (Figure 3), and was approximately 107 feet from the Cooper River. The UST system was installed as part of building construction in 1958. The building was updated in 1985.

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1.2 SITE HISTORY

In 1901, the U.S. Navy acquired 2,250 acres near Charleston to build a shipyard and the first naval officer was assigned duty in early 1902. Subsequently, buildings and a dry dock were constructed in the Naval Yard. The dry dock was completed in 1909 along with several other brick buildings and the main power plant, which is still in operation today. The first ship was placed in dry dock and work began on fleet vessels in 1910. World War I brought about an expansion of the yards, facilities, land area, and work force. The yard built two gunboats, several submarine chasers, and tugs in addition to performing repairs and other services to the fleet. In 1933, building activity had increased principally in construction of several Coast Guard tugs, a Coast Guard cutter, and a Navy gunboat, creating the need for more facilities and a much larger work force. In 1943 civilian work force peaked with almost 26,000 employees divided among three daily shifts. In 1956, construction began on piers, barracks, and buildings for mine warfare ships and personnel. Later in the decade, the facility became a major home port for combatant ships and submarines of the U.S. Atlantic Fleet [Ensafe/Allan & Hoshall, Inc.(E/A&H), 1996b].

In 1993, major cuts in defense spending, as a result in part to the end of the Cold War, caused CNC to be added to the list of bases scheduled for closure under the Defense Base Realignment and Closure Act (BRAC). BRAC regulates the closure and transition of property back to the community (E/A&H, 1996b). With the scheduled closure of the base, operations were scaled back and environmental cleanup proceeded to make the property available for redevelopment after closure. As part of the environmental cleanup process, the UST system at Building NS26 was removed during December 1996 and January 1997.

Between December 15, 1996, and January 8, 1997, UST NS26 was removed, cleaned, and recycled as scrap metal. At the time of removal, severe corrsion and pitting of UST NS26 was observed, but no holes were noted. Piping associated with the UST include a 6-in.-diameter steel pump-out pipe used to evacuate the UST and a 2-in.-diameter steel or galvanized drain line, which connected a drain catch basin inside Building NS26 to the UST. The portion of the drain line located outside Building NS26 was removed during closure activities. Contaminated soil encountered during the UST excavation was stockpiled at the site for bioremediation or disposal. The UST and piping excavations were backfilled with clean soil (SPORTENDETCHASN, 1997).

Groundwater was not encountered during removal of the UST. A total of nine soil samples were collected from the UST NS26 tank and piping excavations. The samples were transported to a fixed-base laboratory and analyzed for volatile organics [benzene, toluene, ethylbenzene, and total xylenes (BTEX) plus naphthalene], polynuclear aromatic hydrocarbons (PAHs), and RCRA metals. Naphthalene

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concentrations in four samples exceeded the RBSL established by the SCDHEC (Risk-Based Corrective Action For Petroleum Releases, January 5, 1998). Soil sampling locations and laboratory data are provided in the Underground Storage Tank Assessment Report for UST NS26, which is included in Appendix A.

1.3 RECEPTOR SURVEY RESULTS

A survey of the site vicinity was conducted by TtNUS personnel to identify potential receptors for petroleum hydrocarbon contamination. The site plan (see Figure 2) depicts the public utilities located within 250 feet of the former UST NS26 location. Specific information concerning the depth of utilities below land surface (bls) is currently unavailable. However, according to facility personnel, utility lines are typically located approximately 2 to 6 feet bls (SPORTENVDETCHASN, 1999). The following utility receptors were located:

- Water utility, sanitary sewer utility: A sanitary sewer line originates at the north side of Building NS26 and extends approximately 100 feet to the northwest toward the intersection of Thompson Avenue and Pledge Street. At this point, the sewer turns to the left, paralleling Pledge Street, and exits the target area about 300 feet to the southwest. Two potable water lines and one saltwater line are located within the target area. The saltwater line is located along the Cooper river, paralleling the shoreline. One potable water line services Building NS26 and enters the building from the southeast. The second potable water line is a northeast-southwest trending main located approximately 170 feet northwest of Building NS26.
- Storm sewer utility: A storm sewer line is located between Building NS26 and Thompson Avenue (approximately 75 feet from the building), which runs parallel to Thompson Avenue. Three storm drains/catch basins are located in the immediate area of Building NS26.
- Electrical utility: An underground electrical service line is located approximately 125 feet northeast of the building. This line parallels Thompson Avenue.

A survey of groundwater users within a 7-mile radius of CNC was performed for the *Final RCRA Facility Investigation Report for Zone I* (E/A&H, 1996b). According to this report, a survey of groundwater users within a 7-mile radius of CNC was conducted by the South Carolina Water Resources Commission to ascertain the extent of any shallow groundwater usage. Results of the water use investigation revealed that no drinking water wells, which utilize the shallow aquifer, are located within a 4-mile radius of CNC. Irrigation wells were not identified within 1,000 feet of the site. Numerous monitoring wells are located

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within 1,000 feet of the site. The nearest surface water body to UST NS26 is the Cooper River located approximately 107 feet to the north and northeast.

There are no city, county, or state zoning ordinances as the property (CNC) is currently owned by the federal government. Information concerning zoning ordinances was obtained from the SOUTHDIV Remedial Project Manager located at 2155 Eagle Drive, North Charleston, South Carolina 29406 (telephone number 843-820-7307).

1.4 REGIONAL GEOLOGY AND HYDROGEOLOGY

CNC is located in Charleston County, South Carolina, in the Lower South Carolina Coastal Plain Physiographic Province on the Cooper River side of the Charleston Peninsula. The peninsula is formed by the confluence of the Cooper and Ashley Rivers. Topography in the area is typical of the South Carolina lower coastal plain and is characterized by having low-relief plains broken by the meandering streams and rivers, flowing toward the coast past occasional marine terrace escarpments (E/A&H, 1996b).

The geology of the Charleston area is typical of the southern Atlantic Coastal Plain. Cretaceous-age and younger sediments thicken seaward and are underlain by older igneous and metamorphic basement rock. Surface exposures consist of recent or Pleistocene sands, silts, and clays of high organic content referred to as the Wando Formation (E/A&H, 1996b). Underlying the Wando Formation, increasing with age, are the Oligocene-age Cooper Group and the Eocene-age Santee Limestone. The Cooper Group is comprised of the Parkers Ferry, Ashley, and Harleyville Formations. The formation of particular importance in the Cooper Group is the Ashley Formation, which was formerly referred to as the Cooper Marl in most regional geologic literature. In more recent geologic nomenclature, the name "Cooper" has been given to a group of formations which includes the Ashley Formation, a pale green to olive-brown, sandy phosphoric limestone or marl, which is locally muddy and/or sandy. In the Charleston area, the Ashley Formation is encountered at a depth of approximately 30 to 70 feet bls. The top of the Ashley Formation has been reported to be associated with an erosional basin and the entire Cooper Unit, including the Ashley Formation, is indicated to be approximately 300 feet thick (E/A&H, 1996b).

Groundwater occurs under water table or poorly confined conditions within the recent or Pliestocene deposits overlying the Ashley Formation of the Cooper Group. Transmissivity in the Pleistocene aquifer is generally less than 1,000 feet per day and well yields are variable, ranging from 0 to 200 gallons per minute (gpm). This groundwater contains high concentrations of iron and is commonly acidic at shallow depths (E/A&H, 1996b).

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The Cooper Group is hydrogeologically significant mainly because of its low permeability. In most locales, its sandy, finely granular limestone produces little or no water, but instead acts as confining material causing artesian conditions in the underlying Santee Limestone. Yields from wells in the Santee are usually less than 300 gpm (E/A&H, 1996b).

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2.0 ASSESSMENT INFORMATION

2.1 SITE-SPECIFIC GEOLOGY AND HYDROGEOLOGY

2.1.1 Site Geology

Sixteen direct push soil borings were advanced at Site 36 under the supervision of a TtNUS geologist between June 17-26, 1999 (see Figure 3). These borings ranged in depth from 6 to 12 feet bls and provided soil samples to characterize the subsurface lithology. On August 4, 1999, five (shallow) monitoring wells were installed to a depth of 14 feet bls and grab samples were collected to describe the subsurface lithology. On August 10, 1999, a vertical delineation well was installed, and on August 17, 1999, a sixth shallow well was installed in an upgradient location. During the drilling process, lithologic samples were collected using a split-spoon sampler to characterize the subsurface lithology from 15 to 36 feet bls. A general view of the subsurface lithology is presented in Figures 4 and 5.

Based on lithologic descriptions from the soil borings and monitoring wells, the subsurface soil generally consists of fine- to medium-grained sand extending from the ground surface to approximately 5 feet bls. Underlying the sand deposit a dark gray silty, clayey sand was encountered to a depth of about 13 feet bls. Underlying this deposit a dark greenish gray silty clay, which contained thin lenses of sand, was encountered to a depth of 36 feet bls. Boring logs are presented in Appendix B.

2.1.2 Site Hydrogeology

Six shallow water table monitoring wells, CNC36-M01, CNC36-M02, CNC36-M03, CNC36-M04, CNC36-M05, and CNC36-M06, and one deep vertical delineation monitoring well, CNC36-M07D, were installed as part of this RA investigation (see Figure 3). The shallow monitoring wells were completed to a depth of 14 feet bls. Each shallow monitoring well was completed using 10 feet of 0.01-inch machine slotted Schedule 40 polyvinyl chloride (PVC) screen that bracketed the water table. Monitoring well CNC06-M07D was completed as a Type III monitoring well with 6-inch-diameter PVC surface casing grouted to a depth of 20 feet bls. After the grout for the surface casing cured for 24 hours, the borehole was advanced to a depth of 36 feet and a 2-inch-diameter PVC monitoring well was installed with a 5-foot, 0.01-inch machine-slotted PVC screen. Well construction logs for the RA monitoring wells are presented in Appendix B. At the completion of the well installations, a South Carolina registered professional surveyor surveyed each monitoring well location and the top of casing elevation.

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Three temporary small diameter PVC piezometers, CNC36-P01 through CNC36-P03, were installed during a direct push investigation. Each piezometer was constructed of 1-1/4-inch-diameter Schedule 80 PVC threaded casing and well screen. The piezometers were completed to a depth of 12 feet bls utilizing 10-foot PVC screen sections that bracketed the water table. The top of casing elevations were surveyed from select piezometers by a TtNUS geologist to a local reference point. The groundwater elevation data obtained from the piezometers were used in conjunction with the field screening data to aid in the placement of permanent monitoring wells.

On August 3, 1999, two permanent piezometers, CNC36-P01 (hereafter referred to as CNC36-P01*) and CNC36-P03*, were installed with 1-1/4-inch-diameter Schedule 80 PVC threaded casing and well screen. The 1-1/4-inch-diameter screen section of the piezometer was placed inside a 2-inch-diameter Schedule 80 PVC screen prepacked with 20/30 silica sand. Each permanent piezometer was completed at 12 feet bls with a 10-foot screen section that bracketed the water table. The permanent piezometer locations and top of casing elevations were surveyed by a South Carolina registered professional surveyor.

Groundwater level measurements collected from the shallow monitoring wells indicates groundwater generally occurs under unconfined conditions at depths of approximately 4 to 6 feet bls in the site area. A complete round of groundwater elevation measurements levels was recorded from the site monitoring wells on September 10, 1999, and are presented in Table 1. Figure 6 presents the groundwater isocontour surface for groundwater elevation measurements collected during the September 10, 1999, field events. Based on the isocontour map, it appears that groundwater flow is to the north, toward the Cooper River.

On August 3, 1999, prior to the installation of CNC36-P01*, the depth to groundwater level was recorded in CNC36-P01; minimally 1.21 feet of free product was encountered. On September 10, 1999, water levels were recorded in CNC36-P01* and CNC36-P03*. CNC36-P03* was found to contain 0.05 feet of free product, none was found in CNC36-P01*. On October 20, 1999, the piezometers were again gauged. CNC36-P03* was found to contain 0.14 feet of free product and CNC36-P01* contained a product sheen. Product thickness measurements are summarized on Table 1 and the areal extent of the free product is depicted on Figure 7.

As part of the Final RFI Report for Zone H (E/A&H, 1996a), a tidal influence investigation was conducted. The objective of the investigation was to provide long-term water level monitoring to determine the effects of the tidal fluctuation on wells and groundwater flow throughout Zone H. During the tidal study water levels were recorded in 19 wells throughout Zone H over 4 days. Measurements were recorded every hour using data loggers. The 4-day period spanned nine high and nine low tide cycles.

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Results of the tidal survey identified a maximum fluctuation in shallow monitoring wells of 1.12 feet with monitoring wells located closer to the tidal source being more influenced by tidal changes than wells on the peninsula. The heterogeneity of the aquifer material may limit or accentuate the tidal response in some wells. Tidal influence from Shipyard Creek appears to be greater than that of the Cooper River (possibly because of the quay wall along the Cooper River). The report concluded that the minimal fluctuations in the groundwater levels were not expected to play a significant role in directing contaminant transport in any direction other than that determined by the natural groundwater gradient (E/A&H, 1996).

2.2 ASSESSMENT RESULTS

Sixteen soil borings were completed as part of the site screening portion of the soil investigation at Site 36. Seven hand auger soil borings were completed to collect soil samples for analysis at a fixed base laboratory to confirm the presence of chemicals of concern (CoCs). The soil borings for screening evaluation were completed using a Direct Push Technology (DPT) rig; and samples were collected to evaluate subsurface soil vapors, soil contaminant concentration (via a mobile laboratory), and groundwater contaminant concentrations (via a mobile laboratory). The soil samples were collected from a maximum depth of 6 feet bis. The soil and groundwater samples collected for mobile laboratory screening were analyzed for BTEX plus naphthalene and for diesel range organics.

Soil samples collected for fixed base laboratory analysis were analyzed for BTEX and naphthalene using U.S. Environmental Protection Agency (USEPA) Method 8260, PAHs using USEPA Method 8270, and metals using USEPA Method 3050B. One sample was collected for total organic carbon (TOC) analysis using USEPA Method 415.1, total recoverable petroleum hydrocarbons (TRPH) using USEPA Method 9071, and grain size analysis using sieve and hydrometer methods. The sample collection was conducted in accordance with the SCDHEC guidance document *Standard Limited Assessment* (June 1997). Lithologic logs for each soil boring are presented in Appendix B. The soil boring locations are shown on Figure 3 and the assessment results are presented in Section 2.4.1.

A comprehensive groundwater monitoring event was conducted on September 10-13, 1999. Groundwater sampling was conducted using a peristaltic pump and low flow, quiescent techniques. The monitoring wells were sampled in accordance with SCDHEC's guidance document *South Carolina Risk-Based Corrective Action for Petroleum Releases* (January 1998). Each well was purged of three to six well volumes or until water quality parameters of pH, temperature, and conductivity stabilized. The field data sheets are included in Appendix C. A summary of the field parameter measurements is presented in

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Table 2. Groundwater samples were analyzed for BTEX and naphthalene using USEPA Method 8260, PAHs using USEPA Method 8270, and metals using USEPA Method 6010B.

2.3 FIELD SCREENING ASSESSMENT

2.3.1 Soil Vapor Assessment

Sixteen soil borings were completed and evaluated for soil vapor concentrations as part of the soil screening assessment at Site 36. Organic vapor analyzer (OVA) headspace measurements were recorded at selected intervals to the top of the water table. Table 3 summarizes the soil vapor screening results, Figure 3 presents the soil boring locations.

Soil boring vapor concentrations ranged from not detected to 80 parts per million (ppm). Four soil borings contained vapor concentrations ranging from 16 to 80 ppm. All measurable soil vapor concentrations were detected at 5 feet bls, which is at or near the water table. This is generally indicative of soil vapor concentrations resulting from contaminated groundwater as opposed to a contaminated soil source area.

The soil vapor assessment was used as a screening method to assist in identifying locations for collection of soil samples and groundwater monitoring wells. Soil sample and monitoring well locations were determined, in part, based on these data.

2.3.2 Soil Mobile Laboratory Results

Soil samples were collected from each soil boring for analysis by a mobile laboratory. The samples were analyzed for BTEX and diesel range organics (DRO) using USEPA Method 8260. The soil samples were selected based on the UST closure analytical results with the additional criteria that the samples originate in the vadose zone above the water table. Table 3 presents a summary of the analytical data from the mobile laboratory.

As indicated in Table 3, analytical results from the field screening reported benzene and toluene below detection limits in all borings. Naphthalene, the most widespread analyte, was detected in four locations at concentrations ranging from 114 micrograms per kilogram (µg/kg) to an estimated 4,400 µg/kg. Other detected analytes include xylenes (two locations), ethylbenzene (one location), and DRO (two locations).

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The mobile laboratory soil analysis was used as a screening method to assist in identifying locations for collection of soil samples for fixed base laboratory analysis and locations for groundwater monitoring wells.

2.3.3 Groundwater Mobile Laboratory Results

One groundwater sample was collected from each soil boring and analyzed in a mobile laboratory for BTEX and DRO using USEPA Method 8260. Table 4 presents a summary of the mobile laboratory analytical results.

Analyte concentrations exceeding the detection limits were detected in five locations. Three analytes, benzene, ethylbenzene, and naphthalene, were detected at concentrations exceeding the SCDHEC RBSLs. Boring CNC36-B06 contained the maximum concentrations of each analyte (benzene = 159 μ g/L, ethylbenzene = 805 μ g/L, naphthalene = 21,300(E) μ g/L). DRO was reported in four locations at concentrations ranging from 8.3 milligrams per liter (mg/L) to 216 mg/L.

The mobile laboratory groundwater analysis was used as a screening method to assist in identifying locations for permanent monitoring wells for the collection of groundwater samples for fixed base laboratory analysis

2.4 CHEMICALS OF CONCERN IN SOIL AND GROUNDWATER

2.4.1 Chemicals of Concern in Soil

Seven subsurface soil samples (plus one duplicate) were collected by hand auger at Site 36 for fixed base laboratory analysis. The soil boring locations are shown on Figure 3 and Table 5 summarizes CoC detection in those samples. Reportable analyte concentrations were detected in samples collected from four locations (CNC36-B01, CNC36-B02, CNC36-B05, and CNC36-B06). Naphthalene concentrations were above the RBSL in two locations; all other analyte concentrations were below the applicable RBSL. The detected analytes and corresponding maximum concentrations are as follows:

- total xylenes = 950 µg/kg,
- benzo(a)anthracene = 680 μg/kg,
- benzo(b)fluoranthene = 600 μg/kg,
- benzo(k)fluoranthene = 230 (J) µg/kg,
- chrysene = 600 µg/kg, and

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naphthalene = 10,100 µg/kg.

The RBSL for sand-rich soils was used based on a grain size analysis completed on sample 36SLB06 indicating a sand-rich matrix (Appendix D). Figure 8 shows the areal distribution of CoCs in soil.

Because UST NS26 contained waste oil, the soil samples were analyzed for metals also. Several target analytes were detected at concentrations exceeding the laboratory detection limits, but there are currently no SCDHEC listed RBSLs for metals in soil. Table 5 presents a summary of the analytical results for metals in soil.

2.4.2 Chemicals of Concern in Groundwater

Groundwater analytical data sheets for the September 10-13, 1999, field event are presented in Appendix D. Table 6 presents the analytical results for CoCs detected in the groundwater samples. Naphthalene was the only groundwater CoC detected above the RBSL (CNC36M-01 = 110 μ g/L; CNC36M-04 = 13 μ g/L); total xylenes and naphthalene were identified at concentrations above the laboratory detection limits. Figure 9 presents distribution of organic CoCs in groundwater for the September 1999 event.

Because UST NS26 was used to store waste oil, the groundwater samples were analyzed for dissolved metals using USEPA Method 6010B (Table 6). Of the SCDHEC target analytes, arsenic (one sample) and barium (all samples) were present at concentrations above the laboratory detection limits; none of the reported concentrations exceeded the applicable RBSL. Please note that the laboratory reporting limits for cadmium (5.82 μ g/L) and silver (7.62 μ g/L) exceed the applicable RBSLs.

2.5 ANALYTICAL DATA

All analytical data from the 1997 Underground Storage Tank Assessment Report for UST NS26 are presented in Appendix A. Fixed base analytical data generated during this RA for soil are summarized in Table 5 and for groundwater in Table 6. The soil and groundwater analytical reports for this RA are included in Appendix D.

2.6 AQUIFER CHARACTERISTICS AND EVALUATION

Groundwater levels were measured from the site monitoring wells on September 10, 1999. The groundwater flow direction across the former UST location is toward the north as illustrated on Figure 6.

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The hydraulic gradient between monitoring wells CNC36-M04 and CNC36-M03 was 0.004595 feet per foot, and the hydraulic gradient between monitoring wells CNC36-M06 and CNC36-M01 was 0.009586 feet per foot. The arithmetic mean of the two gradient values is 0.007091.

As part of the Final RFI Report for Zone I, rising and falling head slug tests were conducted on 11 shallow monitoring wells throughout Zone I to determine the hydraulic conductivity of the surficial aquifer (E/A&H, 1996). Slug tests were conducted by instantaneously removing (rising head) or adding (falling head) a volume (slug) of water from the well and measuring the recovering water level with a data logger. The data were then used to calculate the hydraulic conductivity for the rising head test and the hydraulic conductivity for the falling head test. The average hydraulic conductivity for each well was determined by calculating the geometric mean of the rising and falling head values.

The well construction details and boring logs for each well tested during the RCRA investigation were reviewed to determine which wells were most representative of the conditions present at Site 36. To make this determination the screened interval, lithology, and proximity to the site were evaluated. Based on this evaluation, monitoring well NBCIGDI014 was selected as the most representative well. NBCIGDI014 is located approximately 300 feet northwest of the site and is completed to a depth of approximately 12.5 feet with a 10-foot screened interval. The boring log indicates that the lithology consists of alternating sand, silty sand, clayey sand, and sandy clay, similar to the lithology observed at Site 36. The geometric mean of the rising and falling head conductivity for NBCIGDI014 was 6.94 feet per day (Zone I RFI).

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone, assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \left(\frac{K}{n}\right) x i$$

where:

V = seepage velocity

K = hydraulic conductivity = 6.94 ft/day

n = effective porosity = 0.20

(from sieve results of 46.6% sand, 46.6% silt & 5.4% clay and Figure 4.8, p. 69 in

Applied Hydrology by C.W. Fetter)

i = most recent hydraulic gradient = 0.007091 ft/ft

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therefore:

$$V = \left(\frac{6.94 \text{ ft/day}}{0.20}\right) \times 0.007091 \text{ ft/ft}$$

$$V = 0.2461 \text{ ft/day}$$

In summary, the seepage velocity of the surficial aquifer was calculated to be approximately 90 feet per year based on a hydraulic conductivity of 6.94 feet per day, a hydraulic gradient of 0.007091 feet per foot, and an effective porosity of 0.20 for silty sand. Aquifer characterization graphs and calculations are provided in Appendix E.

2.7 FATE AND TRANSPORT

The Domenico model was the fate and transport model used to determine groundwater site-specific target levels (SSTLs) in the risk analysis. The Domenico dilution/attenuation model is presented in the SCDHEC guidance document, *South Carolina Risk-Based Corrective Action for Petroleum Releases* (SCDHEC 1998). This model is very conservative in that it assumes an infinite mass, areal source condition through which groundwater flows. The model incorporates biological decay effects through a first-order decay process; however, this mechanism was ignored because SCDHEC guidance specifies that the decay rate must be assumed to be zero if site-specific decay rates have not been determined.

The impacted groundwater source area was modeled based on the October 20, 1999, free product recordings in CNC36-P01* and CNC36-P03*. The source area used is 25 feet (7.62 meters) wide and 3 feet (0.91 meters) deep. The maximum source concentrations are assumed to exist throughout the source area, further compounding the conservatism of the estimate. Because of the existence of free product on-site, the maximum solubility in equilibrium with fuel oil calculated using Raoult's Law was used for the maximum constituent concentrations. Fuel oil constituents can vary greatly but were assumed for this investigation to be similar to kerosene, which is typically 44% naphthalene (Conoco, Inc., 1996. CONCAWE Diesel Fuel / Kerosene). Fuel oil was chosen for these calculations because the chemical composition of waste oil stored in the UST is uncertain. Calculations are provided in Appendix F.

Site-specific data were used for saturated hydraulic conductivity, hydraulic gradient, and fraction of organic carbon in soil (2.45E-05 m/sec, 0.0071 feet/feet, and 0.0028 g-C/g-soil, respectively). The soil

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bulk density (1.20 g/cm³) was determined using Figure C3 given in SCDHEC (1998), based on the grain size test results for sample 36SLB060305, 46.6% sand and 5.4% clay. The effective porosity (0.20 cm³/cm³) was estimated by plotting the grain size analysis results (46.6% sand, 46.3% silt, and 5.4% clay) on a ternary diagram (Figure 4.8, p. 69, *Applied Hydrology*, C.W. Fetter) that represents the relationship of grain size and specific yield. Specific yield refers to the percentage of groundwater in the soil pore spaces that will release in response to gravity.

The following estimates of dispersivity were used in the Domenico model as given in SCDHEC (1998):

Parameter	Estimate
Longitudinal Dispersivity, α_x	x/10, where $x = distance$ between the point of
	exposure and the source or compliance point
Transverse Dispersivity, α_y	α _x /3
Vertical Dispersivity, α ₂	α _x /20

Table 7 summarizes fate and transport parameters used in modeling the SSTLs.

2.8 PREDICTED MIGRATION AND ATTENUATION OF CHEMICALS OF CONCERN

The most recent groundwater-gauging event shows that groundwater flow is primarily toward the north. The current extent of impact is limited to wells CNC36-P01* and CNC36-P03*, which contained free product on October 20, 1999, and CNC36-M04 (naphthalene = $13 \mu g/L$). Figure 7 shows the areal extent of free product.

The Domenico model was used to predict the distance at which the tip of the plume is attenuated to SCDHEC RBSLs in 10 and 20 years without using degradation due to biological decay. This was done by adjusting the time to 10 years (3.15x10⁸ sec) and 20 years (6.31x10⁸ sec) and solving for distance (x) by trial and error. The source was assumed to be free product [i.e., the source concentration was assumed to be that of groundwater in equilibrium with fuel oil (see Section 2.6) for the entire 10- and 20- year periods]. Calculated concentrations of benzene, toluene, and naphthalene, at the source (in equilibrium with free product) were greater than their respective RBSLs; therefore, these were the chemicals for which plume distances were calculated. The distance was changed separately for benzene, toluene, and naphthalene until the required distance that is necessary for the concentration to attenuate to the RBSLs was determined. The table below shows the model estimates after 10 and 20 years for migration of

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benzene, toluene, and naphthalene using their respective RBSLs as the indicator of the downgradient plume edge and the approximate time to steady state for the respective CoCs.

Domenico Model Time	CoC	Estimated Distance	Time Period
Period		Traveled	Equilibrium Reached
		(feet)	(years)
10 year	Benzene	220	10
	Toluene	61	9
	Ethylbenzene	1	1
	Xylenes	1	1
	Naphthalene	99	>10
		aliana mandrandi ke alian da 1944. Aking kelong pendang kanalan da	
20 year	Benzene	230	10
	Toluene	61	9
	Ethylbenzene	1	1
	Xylenes	1	1
	Naphthalene	170	19.9

The Cooper River is approximately 110 feet from Site 36. Benzene and naphthalenes are calculated to migrate distances greater than the approximate distance from the site to the Cooper River. Therefore, the Cooper River may be at risk from migration of benzene and naphthalenes from Site 36. Benzene appears to reach steady state within 10 years and naphthalene within 20 years. The Domenico Model calculations are presented in Appendix F.

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3.0 TIER 1 and 2 EVALUATION

3.1 COMPARISON OF ANALYTICAL RESULTS WITH RBSLs

On August 4, 1999, permanent piezometers CNC36-P01* and CNC36-P03* were installed to replace temporary piezometer CNC36-P01 (Figures 3, 6, and 7). CNC36-P01 was judged to be defective as a result of the hydrocarbon interface probe which stuck in the piezometer and recorded erroneous levels of free product. Replacement piezometers were gauged on September 10, 1999; CNC36-P03* contained 0.05 feet of free product and CNC36-P01* contained no measurable product. On October 20, 1999 the piezometers were gauged again; a hydrocarbon sheen was detected in CNC36-P01* and CNC36-P03* contained 0.14 feet of product (Table 1).

One groundwater sampling event was conducted on September 10-13, 1999. Dissolved naphthalene was detected in wells CNC36-M01 (110 µg/L) and CNC36-M04 (13 µg/L) at concentrations exceeding the RBSL of 10 µg/L. No CoCs were detected in the deep well, CNC36-M07D, located about 20 feet west (cross-gradient) of piezometer CNC36-P03*. For concentrations in the wells containing free product (CNC36-P01* and CNC36-P03*) the maximum solubility in equilibrium with fuel oil was calculated using Raoult's Law. Fuel oil constituents can vary greatly but were assumed for this investigation to be similar to kerosene, which is typically 44% naphthalene. Fuel oil was chosen as a surrogate because the chemical composition of the waste oil stored in UST NS36 is not fully known. Results of the Raoult's Law calculations are located in Appendix F. Calculated concentrations for benzene, toluene, and naphthalene (0.31 mg/L, 4.65 mg/L, and 23.35 mg/L, respectively) in equilibrium with free product exceeded their respective RBSLs (0.005 mg/L, 1.0 mg/L, and 0.010 mg/L, respectively).

Six soil samples collected on September 21-24, 1999, were analyzed for BTEX and PAHs including naphthalene by a fixed-base laboratory. Soil naphthalene concentrations exceeded the RBSL in two locations (CNC36-B06 = 4,582 µg/kg, CNC36-B07 = 10,100 µg/kg). Benzene concentration in CNC36-B06 is assumed to exceed the RBSL because the laboratory detection limit (<1,600 µg/kg) exceeded the RBSL.

3.2 SITE CONCEPTUAL EXPOSURE MODEL

This section focuses on the current and future land use issues concerning the site. The building has several drive-in bays and appears to have been an equipment maintenance building. Figure 1 shows that the site is bordered by the CNC to west and south, and by the Cooper River to the north and east. The area surrounding CNC is "mature urban," having long been developed with commercial, industrial, and

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residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. The future use of the property is expected to be industrial or commercial for the foreseeable future after the property is made available for redevelopment as part of the Defense BRAC Act.

Drinking water at the site and surrounding properties is provided by the city of Charleston water treatment plants. A survey of groundwater users within a 7-mile radius of the CNC was provided by the South Carolina Water Resources Commission to ascertain the extent of any shallow groundwater usage. The survey identified no drinking water wells that are screened in the shallow aquifer within a 4-mile radius of the CNC.

Groundwater from the site flows to the north toward the Cooper River, which discharges into Charleston Harbor. Surface water drains into the storm sewer drainage system located to the northeast of the site. The nearest storm drain is located approximately 75 feet north of UST NS26's former location. There are no city, county, or state zoning ordinances, as the federal government currently owns the CNC.

3.3 EXPOSURE PATHWAY ANALYSIS

This section presents the receptor characterizations of the potentially exposed populations in the vicinity of the site and identifies the potentially complete exposure pathways for those receptors. SCDHEC requires that only those exposure pathways with CoC concentrations exceeding Tier 1 RBSL concentrations are examined in a Tier 2 Risk-Based Corrective Action Report. Tables 8 and 9 present the exposure pathway assessments for current and future use scenarios.

3.3.1 On-Site Commercial/Industrial Worker

An on-site commercial or industrial worker is defined as a business employee who works in a commercial/industrial capacity at the site. The future use of the property is expected to be industrial or commercial for the foreseeable future; therefore, an on-site worker was considered as a potential receptor. Incidental ingestion and dermal contact with impacted soil are expected to be negligible for commercial/industrial workers because they are located inside a building. Drinking water at this site is provided by the city; therefore, ingestion of groundwater is not a complete exposure pathway. Building NS26's foundation is assumed to be sufficient to prevent volatilization from both soil and groundwater into a commercial building, and there is no history of vapors in Building NS26. It is unlikely that any additional exposure pathways will exist for future on-site workers; therefore, no complete pathways exist for either current or future commercial/industrial workers.

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3.3.2 On-Site Visitor

An on-site visitor is defined as any person other than a worker who might come on site. On-site visitors would have the same exposure pathways as commercial workers, but their exposure duration would be much shorter. This receptor does not have to be quantified because a potential on-site visitor's chemical intake would not drive risk or cleanup levels at the site.

3.3.3 On-Site Construction Worker

An on-site construction worker is defined as a laborer who would be involved in intrusive activities on or around the site, particularly in the area of subsurface utilities. On-site construction workers could be exposed to constituents in soil by the following pathways: inhalation of volatiles from soil, dermal contact with soil, and incidental ingestion of soil. Surficial soil is not impacted, but subsurface samples collected at CNC36-SB05 and CNC36-SB06 contained naphthalene at concentrations exceeding the RBSL. On-site construction workers could be exposed to constituents in groundwater by the following pathways: inhalation of volatiles from groundwater, dermal contact with groundwater, and incidental ingestion of groundwater. There is a water line and sanitary sewer within 20 feet of the area containing free product; therefore, the point of exposure location for the on-site construction worker is considered to be at the source.

3.3.4 On-Site Resident

An on-site resident is defined as any person making his or her home at the site. This site is expected to remain a commercial/industrial facility; therefore, the on-site resident receptor was not considered further.

3.3.5 Off-Site Resident

An off-site resident is defined as any person making his or her home near the site. This receptor's location is either an actual current residence near the site or is a vacant lot or property on which a residence could be built. The site is located in an area that will likely remain commercial/industrial, including all downgradient properties to the Cooper River. Therefore, this potential receptor was not considered further.

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3.3.6 Surface Water

The Cooper River is located approximately 110 feet downgradient, to the north and northeast of the site. As groundwater appears to flow toward the river, this potential receptor is considered.

3.4 IDENTIFICATION OF DATA REQUIREMENTS

No additional data are required to calculate SSTLs for the site.

3.5 SITE-SPECIFIC TARGET LEVELS

Three future scenarios were considered to calculate SSTLs: on-site construction worker exposure to subsurface soil, on-site construction worker exposure to groundwater, and the groundwater flow into the Cooper River. The minimum SSTL for the three scenarios was selected as the site SSTL for each CoC.

3.5.1 Soil SSTLs Protective of the On-Site Construction Worker

3.5.1.1 Dermal and Ingestion SSTLs

The Site Conceptual Model identified a potential receptor as a construction worker ingesting or having dermal contact with soil while working in a utility trench. For ingestion and dermal contact with soil while working in a utility trench, subsurface soil exposure to a construction worker is similar to surface soil exposure. The RBSLs given by SCDHEC for ingestion and dermal contact with surficial soils by a commercial worker are compared to the maximum site soil concentrations in the table below. (RBSLs for commercial workers are conservative for construction workers. See note below⁽¹⁾.)

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CoC (mg/kg)	RBSL (mg/kg)	Maximum Onsite Concentrations (mg/kg)	Exceed RBSL
Benzene	200	<1.6	No
Toluene	410,000	<1.6	No
Ethylbenzene	200,000	<1.6	No
Xylenes	1,000,000	0.95J	No
Naphthalene	41,000	48.0	No
Benzo(a)anthracene	3.9	0.68	No
Benzo(b)fluoranthene	3.9	0.60	No
Benzo(k)fluoranthene	39	<0.46	No
Chrysene	390	<0.60	No
Dibenzo(a,h)anthracene	0.39	<0.46	Yes

⁽¹⁾ A commercial worker has a typically assumed exposure duration (ED) of 25 years and an exposure frequency (EF) of 250 days/year. A construction worker would be expected to have a much lower exposure duration and exposure frequency based on the nature of utility or construction work. The exposure frequency can be assumed to be 90 days/year and the exposure duration can be assumed to be 1 year. These assumptions are based on the nature of utility work. Therefore, the RBSLs for construction workers are expected to be higher than those for commercial workers.

As shown in the above table, soil concentrations do not exceed the RBSLs for any CoC except dibenzo(a,h)anthracene. The concentrations for dibenzo(a,h)anthracene exceed the commercial RBSL for ingestion or dermal contact with surficial soil. However, the RBSLs provided in the RBCA Guidance assume that a commercial worker will have an exposure duration for 25 years having an exposure frequency of 250 days per year. A construction worker would be expected to have a much lower exposure duration and exposure frequency based on the nature of utility, construction, or remediation work. The exposure frequency can be assumed to be 90 days/year or less and the exposure duration can be assumed to be 1 year or less. These assumptions are based on the nature of typical utility-type work. Furthermore, the maximum source concentrations of dibenzo(a,h)anthracene detected in soils barely exceed the above RBSLs. Therefore, dibenzo(a,h)anthracene is not considered a threat to a construction worker in a utility trench. A construction worker ingesting or contacting impacted soil is not considered atrisk and the dermal/ingestion pathway is not considered for further analysis.

3.5.1.2 Inhalation SSTLs

RBSLs for a construction worker in a trench inhaling volatile vapors from soil were calculated. The calculations are provided in Appendix F. The inhalation RBSLs were calculated using equations given in the American Society for Testing and Materials (ASTM) Standard Guide for Risk-Based Corrective Action Applied to Petroleum Release Sites, Designation E 1739-95E1 (1997). The following table summarizes the calculated RBSLs for the analyzed pathway:

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СоС	Inhalation SSTL (mg/kg)	Maximum Onsite Soil Concentration (mg/kg)	Exceeds SSTL
Benzene	7,853	<1.6	No
Naphthalenes	3,123	48.0	No

Based on the above table, the construction worker exposed to subsurface soil is not at risk if inhaling benzene or naphthalenes volatilizing from the soil.

3.5.2 Groundwater RBSLs Protective of the On-Site Construction Worker

Groundwater RBSLs provided by SCDHEC are for ingestion only; therefore, RBSLs were calculated for the additional pathways of dermal contact, incidental ingestion, and inhalation of volatiles. These calculated RBSLs will be used later in the soil leachability model for determining whether the construction worker is at risk from groundwater leaching through site soils.

Groundwater RBSLs for the construction worker were calculated for three pathways: dermal contact, incidental ingestion, and inhalation of volatiles. A target cancer risk of 1 x 10⁻⁶ and a target hazard quotient of 1 were used in the calculations. Where possible, site-specific parameters were used for site conditions. Standard defaults were used when available and applicable to a construction worker. When no standard parameters were available, conservative assumptions were used. For all pathways, the exposure frequency was assumed to be 90 days/year and the exposure duration was assumed to be 1 year. These assumptions were considered conservative based on the nature of utility work.

The dermal contact RBSLs were calculated using procedures *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment, Interim Guidance* (USEPA Peer Consultation Workshop Draft, 1998). Based on expected limited contact with groundwater, the event frequency was assumed to be one event/day and the event duration was assumed to be 1 hour/event. The skin surface area available for contact was 4500 cm², based on one-fourth the skin surface area given in the risk assessment guidance document for a swimming adult.

The incidental ingestion RBSLs were calculated using the equation given in *Risk Assessment Guidance* for Superfund, Volume I: Human Health Evaluation Manual (Interim Final), (USEPA, 1989). An incidental ingestion rate of 0.01 L/day was assumed based on a fraction (12.5%) of the incidental ingestion rate for a wading adult (0.01 L/hr), considered for an 8-hour work day. The incidental ingestion rate for wading

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adults is given in Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment (USEPA Region 4, 1995).

Utility lines in the area are typically 2 to 6 feet deep. The average depth to groundwater at the point of exposure (CNC06-P03*) is 5.08 feet below top of casing (BTOC). It is assumed that a construction worker might be exposed to chemicals volatilizing from standing groundwater. The inhalation RBSLs were calculated using Henry's Law:

Where H = Henry's Law constant [mg/L-air/mg/L-water]

The RBSL_{AIR} for each chemical was calculated using the equation given in the ASTM *Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites* (1997). SCDHEC values were used for Henry's Law constants.

A water line and a storm sewer are located within 5 to 10 feet of the area containing free product. The point of exposure location for the on-site construction worker was considered to be at the source; therefore, no fate and transport calculations were performed to determine the SSTL protective of the construction worker. The minimum RBSL for the three pathways was chosen as the SSTL for the construction worker.

The maximum dissolved hydrocarbon concentrations at the site were assumed to be the concentration of each compound in equilibrium with fuel oil, calculated using Raoult's Law. These concentrations were used in the following table as the maximum on-site groundwater concentration. The Raoult's calculations are shown Appendix F. The following table shows the calculated RBSLs for each pathway and the groundwater SSTL for the construction worker:

CoC	Dermal RBSL (mg/L)	Incidental Ingestion RBSL (mg/L)	Inhalation RBSL (mg/L)	Selected Minimum Groundwater RBSL (mg/L)	Maximum On- site Ground- water Conc. Based on Raoult's Law (mg/L)	Exceeds RBSL
Benzene	0.85	68.52	0.15	0.15	0.31	Yes
Toluene	23.98	5677.78	5.38	5.38	4.65	No
Ethylbenzene	6.05	2838.89	14.50	6.05	0.10	No
Xylenes	102.33	56777.78	NA*	102.33	0.79	No
Naphthalenes	1.63	1135.56	2.63	1.63	23.35	Yes

Note:* No inhalation reference dose is available for xylenes; therefore, no inhalation RBSL can be calculated.

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Note that the calculated SSTLs for toluene, ethylbenzene, and xylenes exceed the applicable maximum solubility; therefore, those CoCs are not considered a risk to the construction worker exposed to groundwater in a utility trench. Benzene and naphthalene maximum solubility calculations exceed the RBSL for a construction worker exposed to groundwater. Appendix F provides the parameters and results of the RBSL and SSTL calculations.

3.5.3 Soil Leaching SSTLs Protective of the On-Site Construction Worker

Because soil impact exceeds the naphthalene and benzene RBSLs at this site, soil leachability was modeled. The purpose of the model is to calculate SSTLs protective of groundwater with regard to hydrocarbon constituents leaching from impacted soil. The SSTLs were calculated using procedures provided in SCDHEC guidance South Carolina Risk-Based Corrective Action for Petroleum Releases (SCDHEC, 1998). Where possible, site-specific parameters were used for site conditions, in all other cases, SCDHEC defaults are used.

The following table presents the calculated SSTLs and compares them with the worst-case analytical results and the sand-rich soil (< 5 feet from impacted soil to the water table) RBSLs:

Chemical of Concern	Maximum Site Concentration (mg/kg)	Calculated SSTL (mg/kg)	Exceeds SSTL
Benzene	<1.6 *	0.47	Yes
Naphthalene	48	68	No

Note: * Denotes concentration is below the laboratory reporting limit.

The maximum benzene concentration exceeds the calculated SSTLs; therefore, leaching of benzene to the groundwater is a risk to a construction worker exposed to leached groundwater in a utility trench. Appendix F provides the parameters and results of the SSTL calculations.

3.5.4 SSTLs Protective of Surface Water

SSTLs were developed which would protect the Cooper River from potential impact from discharge of impacted groundwater. The Domenico model as described in Section 2.7 was used to determine the groundwater SSTLs for BTEX and naphthalene under steady state conditions. Table 7 provides fate and transport parameters used in the model. The groundwater flow is primarily toward the north toward the

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Cooper River, approximately 110 feet from UST NS26 (Figure 6). CNC06-P03* and CNC06-P01* contained free product during at least two elevation-gauging events; therefore, the area surrounding these monitoring wells was used as the source for predicted migration.

Dissolved hydrocarbon concentrations in CNC36-P03* were assumed to be the concentration of each compound in equilibrium with fuel oil, calculated using Raoult's Law. These concentrations were used in the Domenico model as the source concentrations. The distance from CNC36-P03* to the Cooper River (Figure 1), the nearest point of exposure other than an on-site construction worker, is approximately 110 feet. Using the equilibrium concentrations derived using Raoult's Law, BTEX and naphthalene SSTLs at the source that are protective of the Cooper River were calculated using the referenced Domenico model. Site-specific parameters were used where possible. Calculations are provided in Appendix F.

Groundwater SSTLs protective of the Cooper River were determined to be:

Chemical of Concern	Maximum Onsite Groundwater Conc. Based on Raoult's Law (mg/L)	Source SSTL (mg/L)	Compliance Point SSTL (mg/L)	Exceeds SSTL
Benzene	0.31	0.069	0.010	Yes
Toluene	4.65	13.7	2.0	No
Ethylbenzene	0.10	9.6	1.4	No
Xylenes	0.79	137.4	19.8	No
Naphthalenes	23,35	0.137	0.020	Yes

Based on the model results, calculated concentrations for ethylbenzene, toluene, and xylenes are less than the calculated SSTLs and therefore are no threat to the Cooper River. Benzene and naphthalene calculated concentrations are greater than the SSTL protective of the Cooper River and are considered a possible threat.

3.5.5 Selected SSTLs

The selected SSTLs and the source concentrations are:

Media of Concern	Chemical of Concern	Units	Minimum SSTL	Maximum Source Concentration	Exceeds SSTLs
Soil	Benzene	mg/kg	0.47	<1.6*	Yes
	Naphthalene	mg/kg	68	48	No
Groundwater	Benzene	mg/L	0.069	0.31	Yes
	Toluene	mg/L	5.38	4.65	No
	Ethylbenzene	mg/L	6.05	0.10	No
	Xylenes	mg/L	102.3	0.79	No
	Naphthalenes	mg/L	0.137	23.35	Yes

Note: * Denotes concentration is below the laboratory reporting limit.

The concentration of benzene in the soil exceeds the SSTL, and the concentrations of benzene and naphthalene in groundwater exceeds the calculated SSTLs. These soil and groundwater concentrations may pose a threat to construction workers in nearby utility trenches and the Cooper River.

3.6 RECOMMENDATIONS

Because concentrations in the groundwater and soil exceed the minimum calculated SSTLs protective of a construction worker in a utility trench and the Cooper River, the Author recommends preparing an active Corrective Action Plan.

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4.0 REFERENCES

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4-1 CTO 0103

TABLE 1

GROUNDWATER ELEVATIONS SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL BASE COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

Well#	Total Depth of Well (ft)	Top of Casing Elevation, ft (MSL)	Date Measured	Depth to Water, ft (BTOC)	Depth to Product, ft (BTOC)	Product Thickness (ft)	Groundwater Elevation [†] (MSL)
CNC36-M01	12.67	9.59	13-Aug-99	5.80	ND	ND	3.79
			10-Sep-99	5.81	ND	ND	3.78
CNC36-M02	12.93	9.41	10-Sep- 9 9	5.67	D	ŅD	3.74
CNC36-M03	12.80	8.90	10-Sep-99	5.05	ND	ND	3.85
CNC36-M04	12.95	9.96	10-Sep-99	5.94	ND	ND	4.02
CNC36-M05	13.04	9.94	10-Sep-99	5.86	ND	ND	4.08
CNC36-M06	13.02	8.68	10-Sep-99	3.51	ND	ND	5.17
CNC36-M07	35.92	9.39	10-Sep-99	7.62	ND	ND	1.77
CNC36-680004	13.84	9.22	10-Sep-99	5.46	ND	ND	3.76
CNC36-PO1*	11.55	9.63	10-Sep-99	5,75	ND	ND	3.88
			20-Oct-99	4.61	SH	EEN	5.02
CNC36-P03*	11.81	9.66	10-Sep-99	5.67	5.62	0.05	4.03
			20-Oct-99	4.50	4.36	0.14	5.27

Notes:

MSL - Mean Sea Level BTOC - Below Top of Casing

ND- Not Detected

ft - Feet

^{*} Permanent Piezometer Well

[†] Corrected Depth to Water Measurements Based on Free Product Thickness

GROUNDWATER FIELD MEASUREMENTS SITE 36, BUILDING 26

TABLE 2

ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

Well I.D.	Date Sampled	Purge method	Volume (gallons)	Temp. (° C)	рН	Conductivity (uMHOS/cm)
CNC36-M01	13-Aug-99	PP	5.0	24.9	6.74	2.01
	10-Sep-99	PP	3.5	25.6	6.61	1.35
CNC36-M02	10-Sep-99	PP	4.8	25.3	7.05	2.13
CNC36-M03	10-Sep-99	PP	3.6	25.9	6.94	3.28
CNC36-M04	10-Sep-99	PP	5.6	25.7	6.74	2.39
CNC36-M05	10-Sep-99	PP	6.0	26.1	6.79	1.62
CNC36-M06	10-Sep-99	PP	4.5	27.6	7.04	3.32
CNC36-M07D	10-Sep-99	PP	5.0	24.0	6.43	29.00
CNC36-680004	13-Aug-99	PP	3.9	24.0	6.56	3.36
	10-Sep-99	PP	4.0	24.8	6.64	3.25

Notes:

(°C) - Degrees Celsius

PP - Peristaltic pump, low flow technique uMHOS/cm - Micro HOS per centimerter

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR SOIL SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL BASE COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

SOIL BORING/ SAMPLE NO.	SAMPLE DATE	Benzene (ug/kg)	Toluene (ug/kg)	Ethylbenzene (ug/kg)	Xylenes (m&p) (ug/kg)	Xylenes (o) (ug/kg)	Naphthalene (ug/kg)	DRO (mg/kg)
RBSL (1)		5	1,622	1,260	42,471		210	_
CNC36-B01 / 36SFB010304	17-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B02 / 36SFB020506	17-Jun-99	ND	ND	ND	ND	1,342 (E)	4,440 (E)	424
CNC36-B03 / 36SFB030506	17-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B04 / 36SFB040506	17-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B05 / 36SFB050506	17-Jun-99	ND	ND	ND	ND	ND	198	491
CNC36-B06 / 36SFB060506	19-Jun-99	ND	ND	ND	ND	ND	1920	ND
CNC36-B07 / 36SFB070506	19-Jun-99	ND	ND	70.2	38.4 (J)	16.2 (J)	114	ND
CNC36-B08 / 36SFB080607	19-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B09 / 36SFB090304	19-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B10 / 36SFB100405	19-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B11 / 36SFB110506	21-Jun-99	ND	ND	ND	ND	ND	ND	DM
CNC36-B12 / 36SFB120405	21-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B13 / 36SFB130304	26-Jul-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B14 / 36SFB140304	26-Jul-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B15 / 36SFB150304	26-Jul-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B16 / 36SFB160304	26-Jul-99	ND	ND	ND	ND	ND	ND	ND

Notes

Shaded cells indicate analyte concentrations that exceed the RBSL.

ND - not detected

mg/kg - milligrams per kilogram

ug/kg - micrograms per kilogram

⁽⁴⁾ Indicates presence of analyte at a concentration less than the reporting limit and greater than the detection limit.

⁽E) Indicates presence of analyte at a concentration exceeding the GC/MS calibration parameters.

⁽i) RBSL - South Carolina Department of Health and Environmental Control Risk-Based Screening Levels for clay-rich soils, depth to groundwater less than 5 feet.

SUMMARY OF MOBILE LABORATORY SCREENING RESULTS FOR GROUNDWATER SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL BASE COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

SOIL BORING/ SAMPLE NO.	SAMPLE DATE	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (m&p) (ug/L)	Xylenes (o) (ug/L)	Naphthalene (ug/L)	DRO (mg/L)
RBSL (1)		5	1,000	700	total =	10,000	10 ⁽²⁾	
CNC36-B01 / 36GFB010406	17-Jun-99	ND	11.8	ND	20.6	18.7	68.8° - ¹⁰	ND
CNC36-B02 / 36GFB020608	17-Jun-99	15.2	30.0	20.3	22.9	87.3	467.0	8.3
CNC36-B03 / 36GFB030608	17-Jun-99	24.6	88.9	40.5	22.7	96.5	137.01	6.2
CNC36-B04 / 36GFB040608	17-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B05 / 36GFB050608	17-Jun-99	ND	ND	ND	ND	ND	15.0	ND
CNC36-B06 / 36GFB060508	19-Jun-99	159**.	1,620**	805**	1,700**	2,000**	21,300(E)**	36.9
CNC36-B07 / 36GFB070608	19-Jun-99	73.5(J)**	159**	300**	342**	470**	14,300(E)**	216.0
CNC36-B08 / 36GFB080708	19-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B09 / 36GFB090408	19-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B10 / 36GFB100512	19-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B11 / 36GFB110608	21-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B12 / 36GFB120508	21-Jun-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B13 / 36GFB130512	26-Jul-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B14 / 36GFB140508	26-Jul-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B15 / 36GFB150610	26-Jul-99	ND	ND	ND	ND	ND	ND	ND
CNC36-B16 / 36GFB160610	26-Jul-99	ND	ND	ND	ND	ND	ND	ND

Notes:

Shaded cells indicate analyte concentrations that exceed the RBSL.

ND - not detected

mg/L - milligrams per Liter

ug/L - micrograms per Liter

⁽E) Indicates presence of analyte at a concentration exceeding the GC/MS calibration parameters.

⁽i) Indicates presence of analyte at a concentration less than the reporting limit and greater than the detection limit.

⁽¹⁾ SCDHEC RBSL - South Carolina Department of Health and Environmental Control Risk-Based Screening Levels

⁽²⁾ The Risk Based Screening Level for an Individual PAH CoC is 10 ug/L.

^{**} Indicates a 10X dilution.

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN SOIL SITE 36, BUILDING NS26

ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

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Soil Boring / Sample No.	Sample Date	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl- benzene (ug/kg)	Xylenes (total) (ug/kg)	Benzo(a) anthracene (ug/kg)	Benzo(b) fluoranthene (ug/kg)	Benzo(k) fluorarithene (ug/kg)	Chrysene (ug/kg)	Dibenzo(a,h) anthracene (ug/kg)	Naphthalene (ug/kg)
RBSL (1)		5	1,622	1,260	42,471	73,084	29,097	231,109	12,998	87,866	210
CNC36-B01 / 36SLB010304	22-Sep-99	< 6	< 6	< 6	< 6	< 400	< 400	< 400	< 400	< 400	< 6
CNC36-B0 / 36SLB010304D ⁽²⁾	22-Sep-99	< 7	< 7	< 7	< 7	680	600	230 (J)	600	< 460	< 7
CNC36-B02 / 36SLB020405	21-Sep-99	< 7	_ < 7	< 7	< 7	< 430	220 (J)	< 430	< 430	< 430	< 7
CNC36-B03 / 36SLB030405	21-Sep-99	< 7	< 7	< 7	< 7	< 430	< 430	< 430	< 430	< 430	< 7
CNC36-B04 / 36SLB040304	23-Sep-99	<6	<6	<6	<6	< 400	< 400	< 400	< 400	< 400	<6
CNC36-B05 / 36SLB050405	21-Sep-99	< 8	< 8	< 8	< 8	< 460	< 460	< 460	< 460	< 460	4,582
†CNC36-B06 / 36SLB060304	24-Sep-99	<1,600	<1,600	<1,600	950 (J)	< 430	< 430	< 430	< 430	< 430	48,000
‡CNC36-B07 / 36SLB070304	23-Sep-99	<6	<6	<6	< 6	< 430	< 430	< 430	< 430	< 430	<6

Notes:

All concentrations are in micrograms per kilogram (ug/kg).

Shaded cells indicate analyte concentrations that exceed the RBSL.

NA - Not Analyzed

- (J) Indicates the presence of an analyte at a concentration less than the reporting limit and greater than the detection limit.
- † USEPA Method 8260 analysis was performed on 9/30/99; compound recovery for 3 of 4 surrogates was out of criteria and naphthalene concentration was out of calibration. The sample was on 9/30/99 and 10/2/99. The 10/2/99 analysis (results reported above) used a dilution factor of 330. This analysis was chosen because of improved surrogate recovery (4 of 4 within criteria)
- ‡ USEPA Method 8260 analysis was performed on 9/29/99 (reported above) and on 9/30/99. The additional analysis was performed because the surrogate compound recovery was out of crite 3 of 4 of the surrogates. The re-analysis results are believed to be less reliable because surrogate compound recovery was out of criteria by a greater margin than in the initial analysis.

⁽¹⁾ South Carolina Department of Health and Environmental Control Risk-Based Screening Levels for sandy soils; depth to groundwater less than 5 feet.

⁽²⁾ Duplicate Sample

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN SOIL SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA PAGE 2 OF 2

Soil Boring / Sample No.	Sample Date	TPH (mg/kg)	TOC (mg/kg)
CNC36-B01 / 36SLB010304	22-Sep-99	181	NT
CNC36-B01 / 36SLB010304D	22-Sep-99	577	NT
CNC36-B02 / 36SLB020405	21-Sep-99	442	NT
CNC36-B03 / 36SLB030405	1 22-Sep-99		NT
CNC36-B04 / 36SLB040304	23-Sep-99	1,300	NT
CNC36-B05 / 36SLB050405	22-Sep-99	878	NT
CNC36-B06/ 36SLB060304	23-Sep-99	234	NT
CNC36-B07/ 36SLB070304	24-Sep-99	351	NT
CNC36-B12 / 36SLB120304	22-Sep-99	NT	1,040
CNC36-B12 / 36SLB120304D ⁽¹⁾	22-Sep-99	NT	2,840

Notes:

NT - Analysis not performed.

⁽¹⁾ Duplicate Sample

TABLE 6

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA PAGE 1 OF 2

Monitoring Well/ Sample No.	Sample Date	Benzene (ug/L)	Ethyl- benzene (ug/L)	Toluene (ug/L)	Xylenes (total) (ug/L)	Naphthalene (ug/L)	Benzo(a) anthracene (ug/L)	Benzo(b) fluoranthene (ug/L)	Benzo(k) fluoranthene (ug/L)	Chrysene (ug/L)	Dibenzo(a,h) anthracene (ug/L)	MTBE (ug/L)
RBSL ⁽¹⁾		5	700	1,000	10,000	10 (2)	10 ⁽²⁾	10 ⁽²⁾	10 ⁽²⁾	10 ⁽²⁾	10 ⁽²⁾	40
CNC36G-80 / 36GLG680004	13-Aug-99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-01 / 36GLM0101	13-Aug-99	4 (J)	13	35	62	110	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-02 / 36GLM0201	13-Sep-99	< 5	< 5	3 (J)	3 (J)	9	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-02 / 36GLM0201D ⁽³⁾	13-Sep-99	< 5	< 5	< 5	< 5	6 (B)	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-03 / 36GLM0301	13-Sep-99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-04 / 36GLM0401	10-Sep-99	< 5	4 (J)	< 5	6	13 (B)	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-05 / 36GLM0501	10-Sep-99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-06 / 36GLM0601	13-Sep-99	< 5	< 5	< 5	< 5	< 5	< 10	< 10	< 10	< 10	< 10	< 5
CNC36M-07 / 36GLM0701	10-Sep-99	< 5	< 5	< 5	< 5	<5	< 10	< 10	< 10	< 10	< 10	<5

Notes:

All concentrations are in ug/L.

Shaded cells indicate analyte concentrations that exceed the RBSL.

NA - Not analyzed

- (1) South Carolina Department of Health and Environmental Control Risk-Based Screening Levels for groundwater.
- (2) The risk-based screening level for individual PAH CoC is 10 ug/L or 25 ug/L for total PAHs.
- (3) Duplicate sample.
- (B) Indicates the detection of analyte in laboratory method blank.
- (J) Indicates presence of analyte at a concentration less than the reporting limit and greater than the detection limit.

SUMMARY OF FIXED-BASE LABORATORY ANALYTICAL RESULTS FOR CHEMICALS OF CONCERN IN GROUNDWATER SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

PAGE 2 OF 2

Monitoring Well/ Sample No.	Sample Date	Lead (ug/L)	Arsenic (ug/L)	Barium (ug/L)	Cadmium (ug/L)	Total Chromium (ug/L)	Mercury (ug/L)	Selenium (ug/L)	Silver (ug/L)
RBSL ⁽¹⁾		15	50	2,000	5	100	2	50	5
CNC36O-80 / 36GLO680004	10-Sep-99	<1.09	<2.07	47.2	<1.94	<4.31	<0.02	<2.57	<2.54
CNC36M-01 / 36GLM0101	10-Sep-99	<1.09	<2.07	22.0	<1.94	<4.31	< 0.02	< 2.9	< 2.54
CNC36M-02 / 36GLM0201	13-Sep-09	< 1.09	< 2.07	27.1	< 1.94	< 4.31	< 0.02	< 2.57	< 2.54
CNC36M-02 / 36GLM0201D	13-Sep-09	< 1.09	< 2.07	27.5	< 1.94	< 4.31	< 0.03	< 2.57	< 2.54
CNC36M-03 / 36GLM0301	13-Sep-09	2 (B)	< 2.07	42.9	< 1.94	< 4.31	< 0.02	< 2.57	< 2.54
CNC36M-04 / 36GLM0401	10-Sep-99	< 1.09	< 2.07	24.8	< 1.94	< 4.31	< 0.02	< 2.57	< 2.54
CNC36M-05 / 36GLM0501	10-Sep-99	< 1.09	< 2.07	19.8	< 1.94	< 4.31	< 0.02	< 2.57	< 2.54
CNC36M-06 / 36GLM0601	13-Sep-09	2 (B)	39.7	12.0	< 1.94	< 4.31	< 0.02	< 2.57	< 2.54
CNC36M-07 / 36GLM0701	10-Sep-99	< 3.27 [†]	< 6.21 [†]	103	< 5.82 [†]	< 12.93 [†]	< 0.02	< 7.71 [†]	< 7.62 [†]

Notes:

All concentrations are in ug/L.

⁽¹⁾ South Carolina Department of Health and Environmental Control Risk-Based Screening Levels for groundwater.

⁽t) Indicates a 3X dilution factor.

⁽B) Indicates the detection of analyte in laboratory method blank.

FATE AND TRANSPORT INPUT PARAMETERS SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

Parameter	Domenico Dilution/Attenuation Model ⁽¹⁾
Hydraulic Conductivity [m/sec]	2.45E-05
Hydraulic Gradient	0.0071
Porosity (effective)	0.2
Estimated Plume Length [ft]	NA NA
Soil Bulk Density ^(a) [kg/L]	1.2
Partition Coefficient [L/kg]	chemical specific
Fraction of Organic Carbon in soil [g/g]	2.84E-03
First Order Decay Rate [sec-1]	0
Modeled Plume Length [ft]	NA
Modeled Plume Width [ft]	NA NA
Source Width ^(b) [m]	7.62
Source Thickness ^(b) [m]	0.91
Soluble Mass [kg]	Infinite ^(c)

Notes:

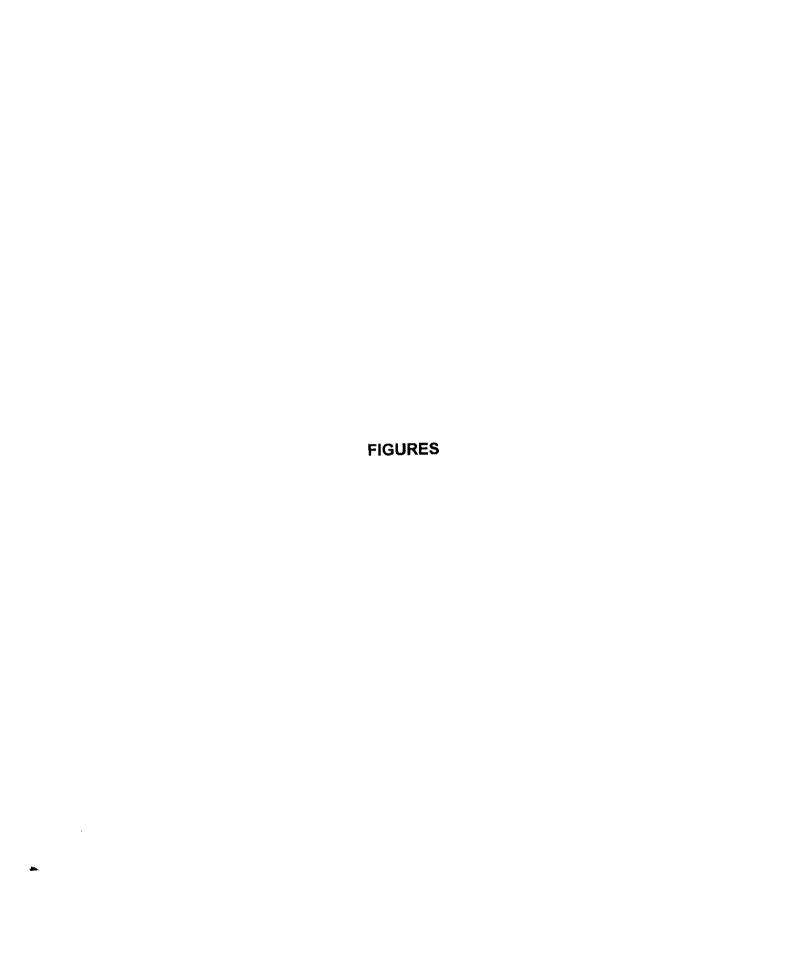
- (1) South Carolina Risk-Based Corrective Action for Petroleum Releases, South Carolina Department of Health and Environmental Control, 1998.
- (a) Determined from SCDHEC 1998, Tables C1 and C3
- (b) Site-specific data
- (c) Assumption of the Domenico model

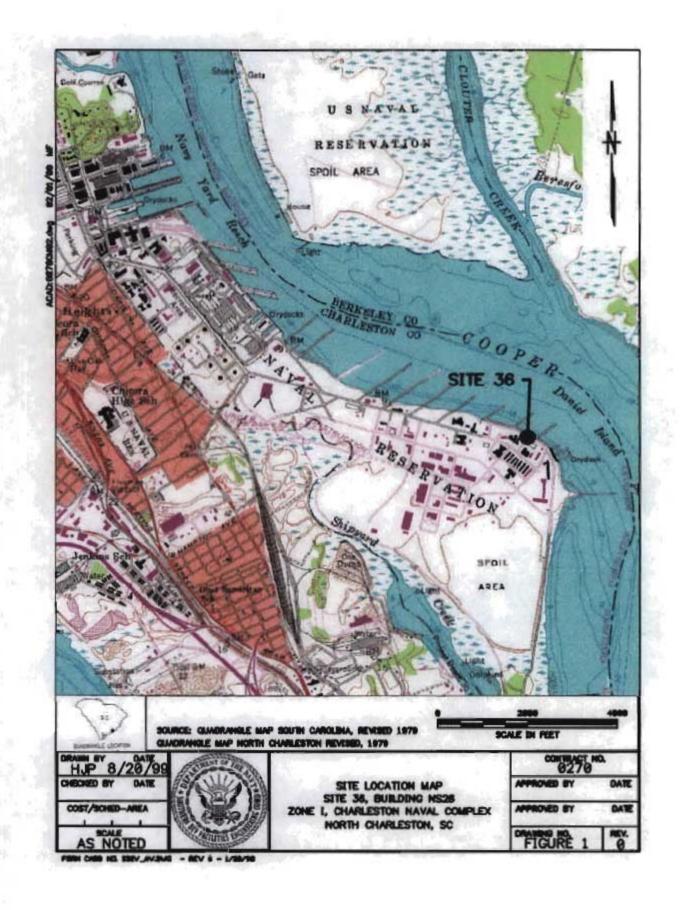
EXPOSURE PATHWAY ASSESSMENT - CURRENT USE SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

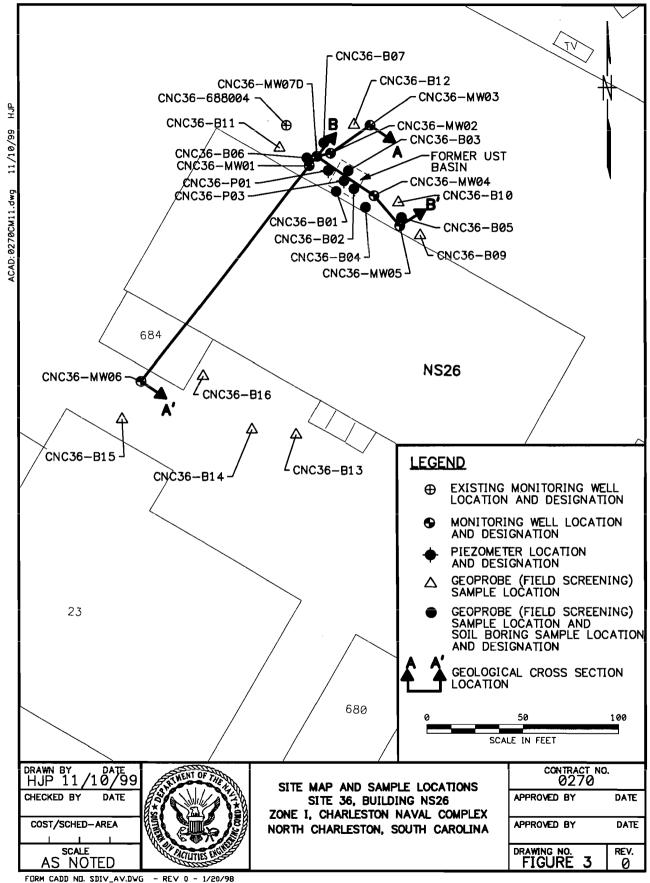
Media	Exposure Route	Pathway Selected for Evaluation?	Exposure point or Reason for Non- Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	Free product and groundwater plumes	
	Explosion Hazard	No	outside building location. No volatilization to enclosed space. No explosion hazard.	
Groundwater	Ingestion	No	No water supply well downgradient or	
	Dermal contact	No	buildings with basements.	
	Inhalation	No		
Surface Water	Ingestion	No	Cooper River 110 feet	
	Dermal contact	No	downgradient. No recreational use of the river in the immediate	
	Inhalation	No	area. Plume limited to site area.	
Surficial Soil	Ingestion	No	No impacted surface soil, ground surface is	
	Dermal contact	No	paved.	
	Inhalation	No		
Subsurface Soil	Ingestion	No	Ground surface is paved.	
	Dermal contact	No	1.00	
	Inhalation	No		
	Leaching to Groundwater	No		

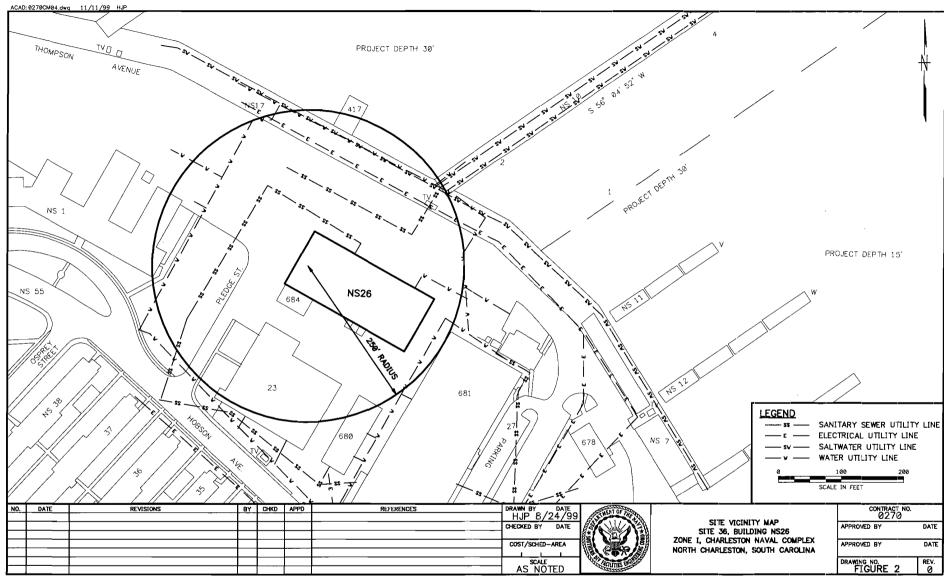
EXPOSURE PATHWAY ASSESSMENT - FUTURE USE SITE 36, BUILDING NS26 ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

Media	Exposure Route	Pathway Selected for Evaluation?	Exposure point or Reason for Non- Selection	Data Requirements (If pathway selected)
Air	Inhalation	No	Free product and groundwater plumes	
	Explosion Hazard	No	outside building location. No volatilization to	
			enclosed space. No explosion hazard.	
Groundwater	Ingestion	Yes	Future use of property expected to be industrial	No additional data required.
	Dermal contact	Yes	or commercial. Groundwater level within 6	
	Inhalation	Yes	feet of ground surface; therefore, construction worker exposure possible.	
Surface Water	Ingestion	Yes	Cooper River located approx. 110 feet	No additional data required.
	Dermal contact	Yes	downgradient, possible plume migration to river.	104=110=1
	Inhalation	No	piono inigiation to troop.	
Surficial Soil	Ingestion	No	No impacted surface soil, ground surface is paved.	
	Dermal contact	No	ground surface is paved.	
	Inhalation	No		
Subsurface Soil	Ingestion	Yes	Future use of property expected to be industrial	No additional data required.
	Dermal contact	Yes	or commercial. Intrusive construction possible;	Toquileu.
	Inhalation	Yes	therefore, construction worker exposure	
	Leaching to Groundwater	Yes	possible.	

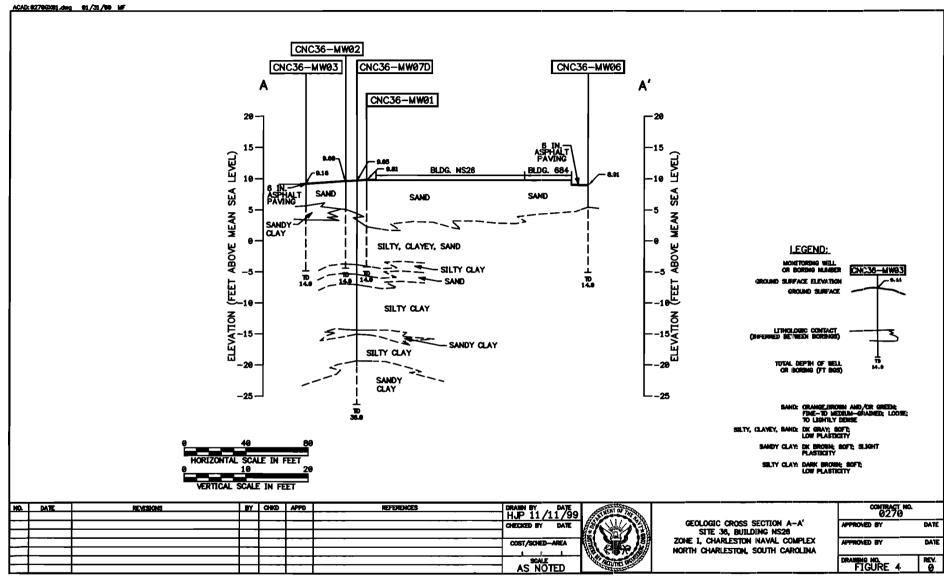




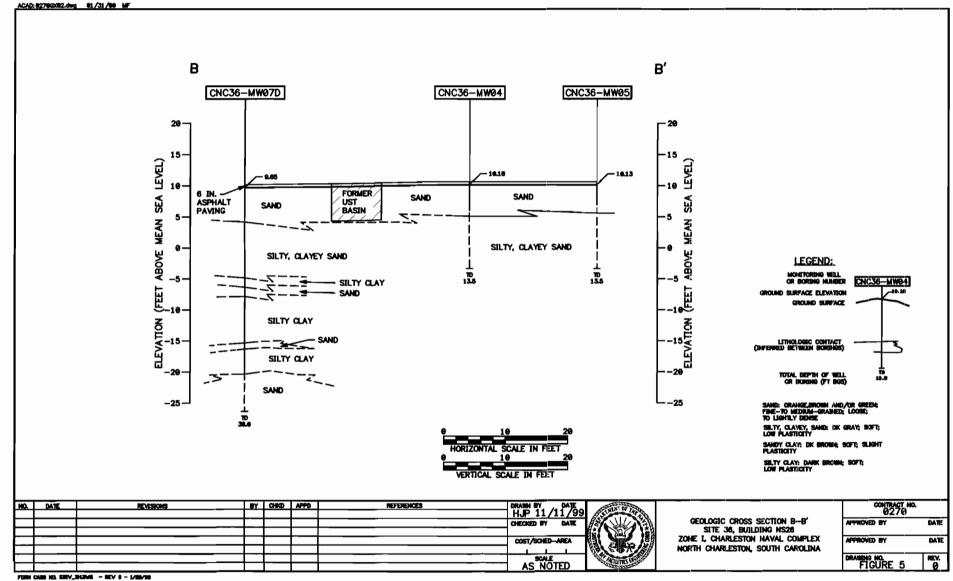


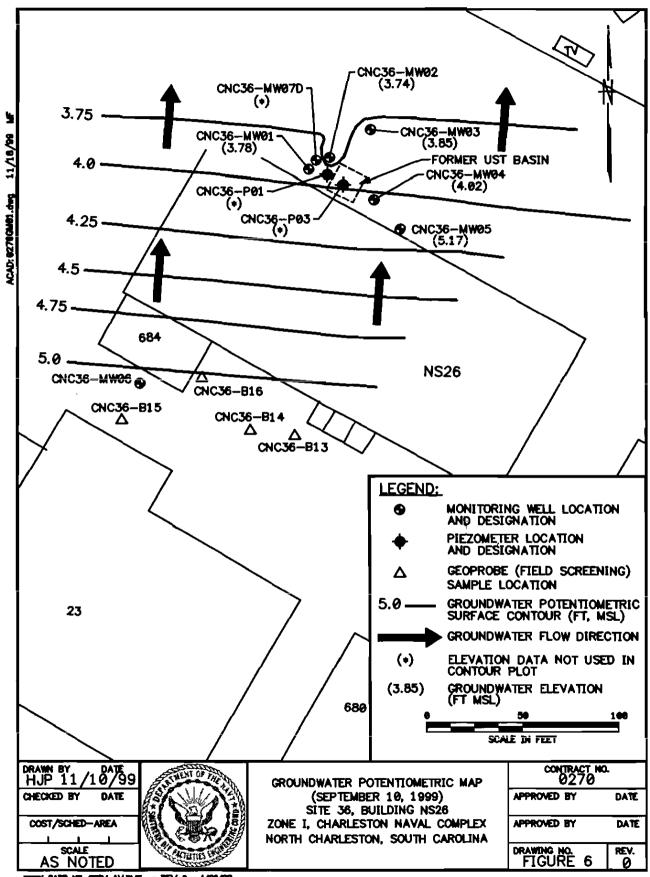


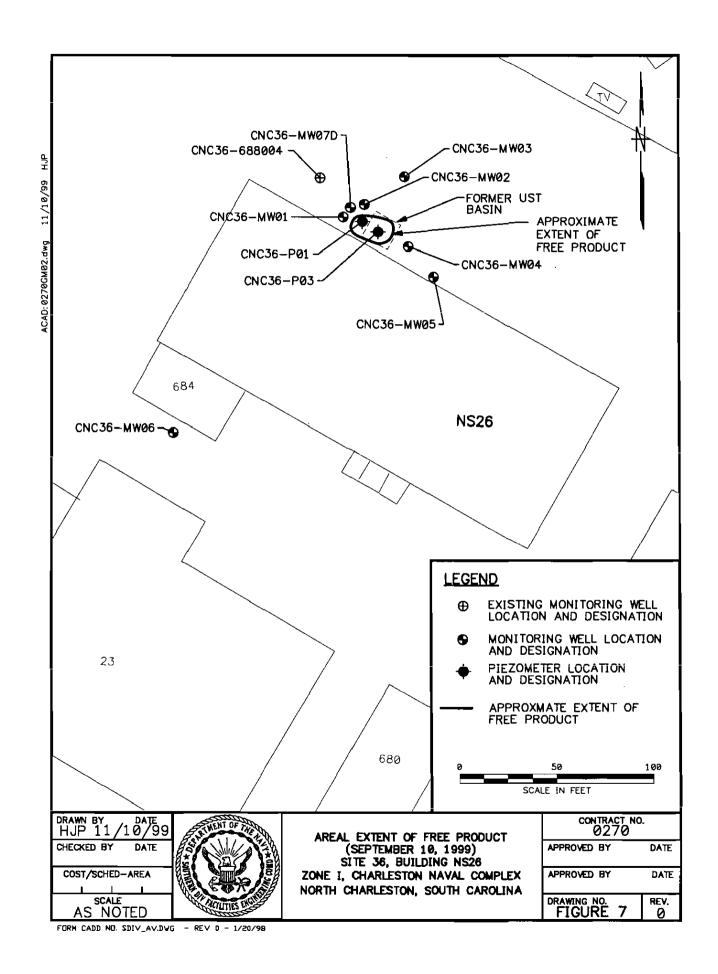
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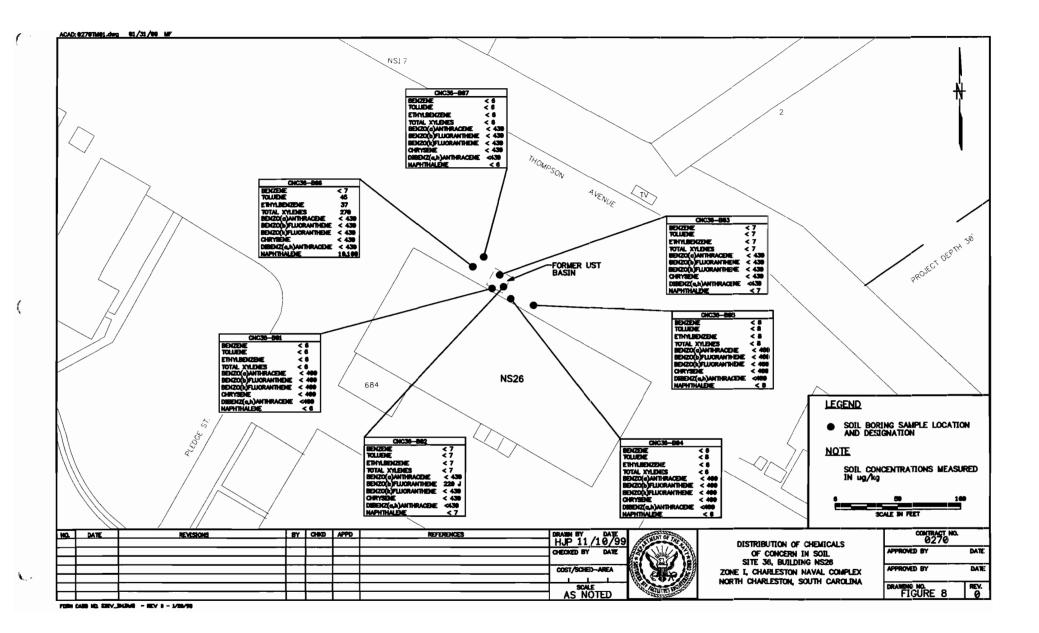


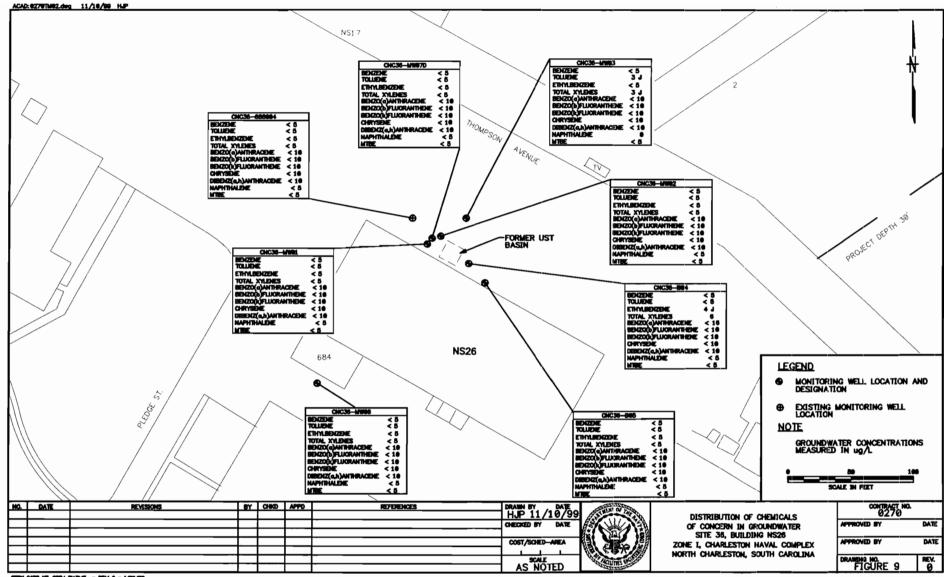
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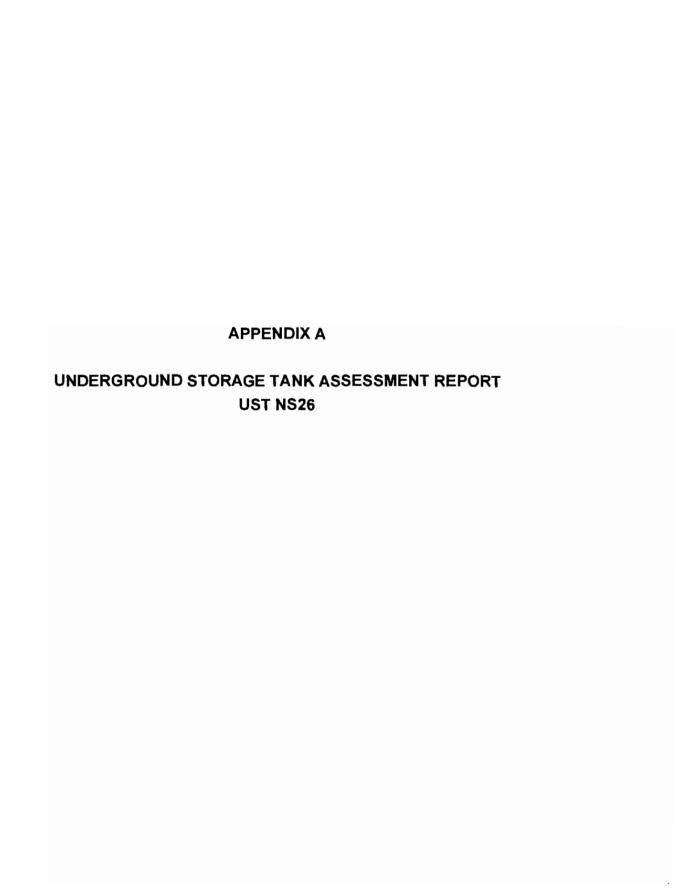








FERNICASE NO. SELV. BASMS - NEV 0 - 1/20/20



Waste OII 5 Shallow

South Carolina Department of Health and Environmental Control (S.C.D.H.E.C.)
Underground Storage Tank (UST) Assessment Report

Date Received

State Use Only

Submit Completed Form to: UST Regulatory Section : SCDHEC 2600 Bull Street Columbia, South Carolina 29201 Telephone (803) 734-5331

L OWNERSHIP OF UST(S)

Agency/Owner: Southern Division, Naval Facilities Engineering Command, Caretaker Site Office

Mailing Address: P.O. Box 190010

City: N. Charleston State: SC Zip Code: 29419-9010

Area Code: 803 Telephone Number: 743-9985 Contact Person: LCDR Paul Rose

II. SITE IDENTIFICATION AND LOCATION

Site I.D. #:	Unregulated
Facility Name:	Charleston Naval Base Complex, Building NS 26
Street Address:	Thompson Avenue
City:	North Charleston, 29405-2413 County: Charleston

III. CLOSURE INFORMATION

Closure Started: 15 Dec 1996	Closure Completed: 8 Jan 1997
Number of USTs Closed: 1 N/A	SPORTENVDETCHASN
Consultant	UST Removal Contractor

IV. CERTIFICATION (Read and Sign after completing entire submittal)

I certify that I have personally examined and no familiar with the information submitted in this and all attached documents and that based so my impairy of those individuals suspensible for abtaining that information, I believe that the submitted information is tree, activitie and complains. LCDR Paul Rose
Name (Type or Print)
Signature

V.	UST INFORMATION	Tank 1	Tank 2	Tank 3	Tenk 4	Tank 5	Tank 6
Pro	oduct	Waste oil					
Ca	pacity	200 gal					
Ag	e	> 30 yra.					
Со	nstruction Material	Steel					<u>.</u>
Mo	onth/Year of Last Use	Unik.					
De	pth (ft.) To Base of Tank	5.5'					
Spi	ll Prevention Equipment Y/N	N					
Ov	erfill Prevention Equipment Y/N	N					
Me	thod of Closure Removed/Filled	R					
Vis	ible Corrosion or Pitting Y/N	Y					
Vis	ible Holes Y/N	N					

L. Method of disposal for any USTs removed from the ground (attach disposal manifests)

UST NS 26 was removed, drained, cut open at both ends, and cleaned with a steam cleaner. It was then cut up for recycling as scrap metal. (See Attachment III.)

M. Method of disposal for any liquid petroleum, sludges, or waste waters removed from the USTs (attach disposal manifests)

The residual fuel oil, waste water, and sludge were recycled.

N. If any corrosion, pitting, or holes were observed, describe the location and extent for each UST

UST NS26 was severely corroded and pitted, but no holes were found.

VI. PIPING INFORMATION

		1	 	1 11111111	144.	1 min o
A.	Construction Material	Steel	 			
B.	Distance from UST to Dispenser	3'				
C.	Number of Dispensers	l See note 1				
D.	Type of System P/S	See note 1				
E.	Was Piping Removed from the Ground? Y/N	Y				
F.	Visible Corrosion or Pitting Y/N	Y	 :			
G.	Visible Holes Y/N	N				
H.	Age	> 30 yrs.				
Note 1:	UST NS26 was a gravity fed waste oil tank for Building 26.					

Tank 1 | Tank 2 | Tank 3 | Tank 4 | Tank 6 | Tank 6

 If any corrosion, pitting, or holes were observed, describe the location and extent for each line.

All piping associated with the tank was pitted and corroded, but no holes were found.

VII. BRIEF SITE DESCRIPTION AND HISTORY

Building NS 26 was part of the Navy's Shore Intermediate Activity (SIMA) complex. The building was built in 1958 and renovated in 1985. Although an oil/water separator is referenced in early building plans, no separator could be located at the time of the tank removal. It is assumed that the oil water separator piping has not been used since the 1985 renovation. The tank apparently continued to be used by pouring used oil down the six inch pump-out pipe.

After sample results were reviewed, efforts were made to "chase" (remove) contaminated soil at the site. The northwest end of the excavation was extended in an effort to recover petroleum contaminated soil. As digging proceeded, OVA readings were taken using the Micro FID flame ionization detector to determine how far to proceed. The OVA reading at the end of the original excavation was 558 parts per million (ppm). The excavation was extended approximately 7 feet out and 8 feet below ground surface level. OVA readings did not improve. The last OVA reading, taken along with soil sample SPORT 0319-1, registered 3005 ppm. Since no improvement was noted based on OVA readings and the excavation was about to impact sewer piping, digging was discontinued.

A .	Were any petroleum-stained or contaminated soils found in the UST excavation, soil borings, trenches, or monitoring wells? If yes, indicate depth and location on the site map. [UST excavation]	x		
В.	Were any petroleum odors detected in the excavation, soil borings, trenches, or monitoring wells? If yes, indicate location on site map and describe the odor (strong, mild, etc.) [strong, UST excavation]	x		
C.	Was water present in the UST excavation, soil borings, or trenches? If yes, how far below land surface (indicate location and depth)?		x	
D.	Did contaminated soils remain stockpiled on site after closure? If yes, indicate the stockpile location on the site map. Name of DHEC representative authorizing soil removal: See note 2.	x		
E.	Was a petroleum sheen or free product detected on any excavation or boring waters? If yes, indicate location and thickness on the site map.		N/A	

Note 2: The tank and piping excavations were filled with clean dirt. The contaminated soil has been stockpiled for bioremediation or disposal. Per conversation with DHEC, Mr. Tim Mettlen, and SouthDiv, Mr. Gabriel Magwood, petroleum contaminated soil may be removed from the excavation and stockpiled for disposal or remediation.

IX. SAMPLE INFORMATION

S.C.D.H.E.C. Lab Certification Number 10120

SPORT O280-1 South end of tank Soil S.5' 18 Dec 96 R 1916 ppm	Sample #	Location	Sample Type (Soil/Water)	Depth*	Date/Time of Collection	Collected By	OVA#
1010 Atkins		South end of tank.		5.5'	18 Dec 96	R	1916 ppm
0280-3 1020 Atkins SPORT Beneath vent pipe up-turned older Soil 1'6" 18 Dec 96 not pipe up-turned older R. oppm not pipe up-turned older 0 ppm not pipe up-turned older Soil - 18 Dec 96 not pipe up-turned older R. oppm not pipe up-turned older 1030 not pipe up-turned older R. oppm not pipe up-turned older 1030 not pipe up-turned older R. oppm not pipe up-turned older 1030 not pipe up-turned older R. oppm not pipe up-turned older 163 ppm not pipe up-turned older SPORT Bottom of expanded UST Soil 8' 22 Jan 97 R. 3005 ppm		North end of tank.	Soil				558 ppm
0280-4 elbow. 1030 Atkins SPORT Dirt pile. Soil - 18 Dec 96 R. Atkins 163 ppm 0280-5 Bottom of expanded UST Soil 8' 22 Jan 97 R. 3005 ppm	0280-3				1020		14 ppm
0280-5	0280-4	elbow.		1'6*	1030	Atkins	
	0280-5			-	1040	Atkins	
			Soil	8'			3005 ppm
		_					
							

^{• =} Depth Below the Surrounding Land Surface

X. SAMPLING METHODOLOGY

Provide a detailed description of the methods used to collect and store (preserve) the samples.

After the removal of UST NS26 soil samples were taken. Sampling was performed in accordance with SC DHEC R.61-92 Part 280 and SC DHEC UST Assessment Guidelines.

The samples are identified as follows:

	Detachment Charles	ton	General Engineering Labs
Soil Sample	UST26-1	=	SPORT -0280-1
Soil Sample	UST26-2	=	SPORT -0280-2
Soil Sample	UST26-3	=	SPORT -0280-3
Soil Sample	UST26-4	=	SPORT -0280-4
Soil Sample	UST26-5	=	SPORT -0280-5
VOA Trip Blank		=	SPORT -0280-6
Soil Sample	UST26-6	=	SPORT -0319-1
VOA Trip Blank	****	=	SPORT -0319-2

Sample jars were prepared by the testing laboratory. The grab method was utilized to fill the sample containers leaving as little head space as possible and immediately capped. Soil samples were extracted at the tank ends. UST piping soil samples were taken under the piping at the mechanical connections.

The samples were marked, logged, and immediately placed in sample coolers packed with ice to maintain an approximate temperature of 4° C. Tools were thoroughly cleaned and decontaminated with organic-free soap and water after each sample.

The samples remained in the custody of SPORTENVDETCHASN until they were transferred to General Engineering Laboratories for analysis as documented in the attached Chain-of-Custody Record.

XI. RECEPTORS

Yes No

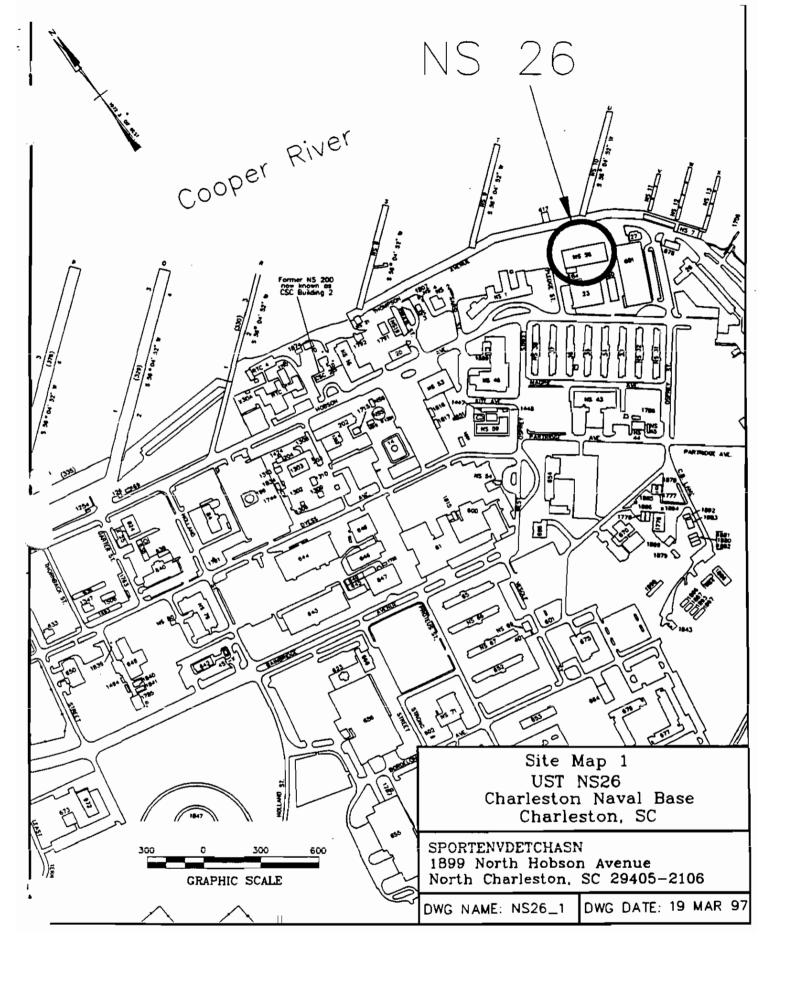
A .	Are there any lakes, ponds, streams, or wetlands located within 1000 feet of the UST system? [Cooper River ~ 107] If yes, indicate type of receptor, distance, and direction on site map.	x	
В.	Are there any public, private, or irrigation water supply wells within 1000 feet of the UST system? If yes, indicate type of well, distance, and direction on site map.		x
C.	Are there any underground structures (e.g., basements) located within 100 feet of the UST system? If yes, indicate the type of structure, distance, and direction on site map.		x
D.	Are there any underground utilities (e.g., telephone, electricity, gas, water, sewer, storm drain) located within 100 feet of the UST system that could potentially come in contact with the contamination? [sewer, steam line] If yes, indicate the type of utility, distance, and direction on the site map.	x	
E.	Has contaminated soil been identified at a depth of less than 3 feet below land surface in an area that is not capped by asphalt or concrete? If yes, indicate the area of contaminated soil on the site map.		х

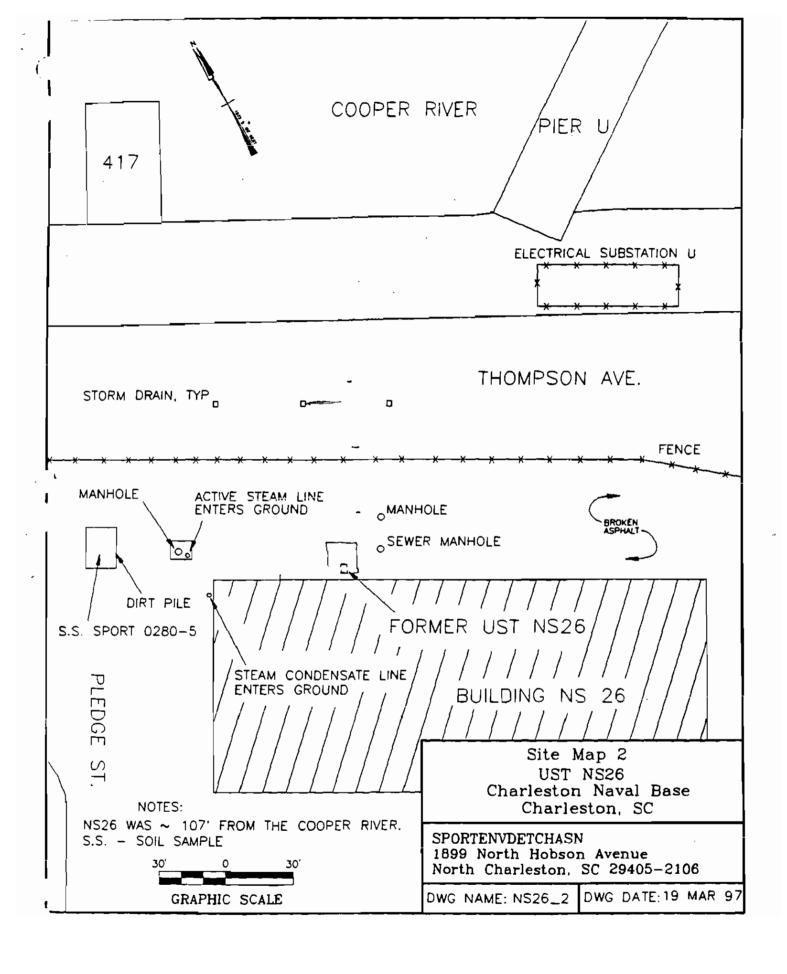
Attachment I

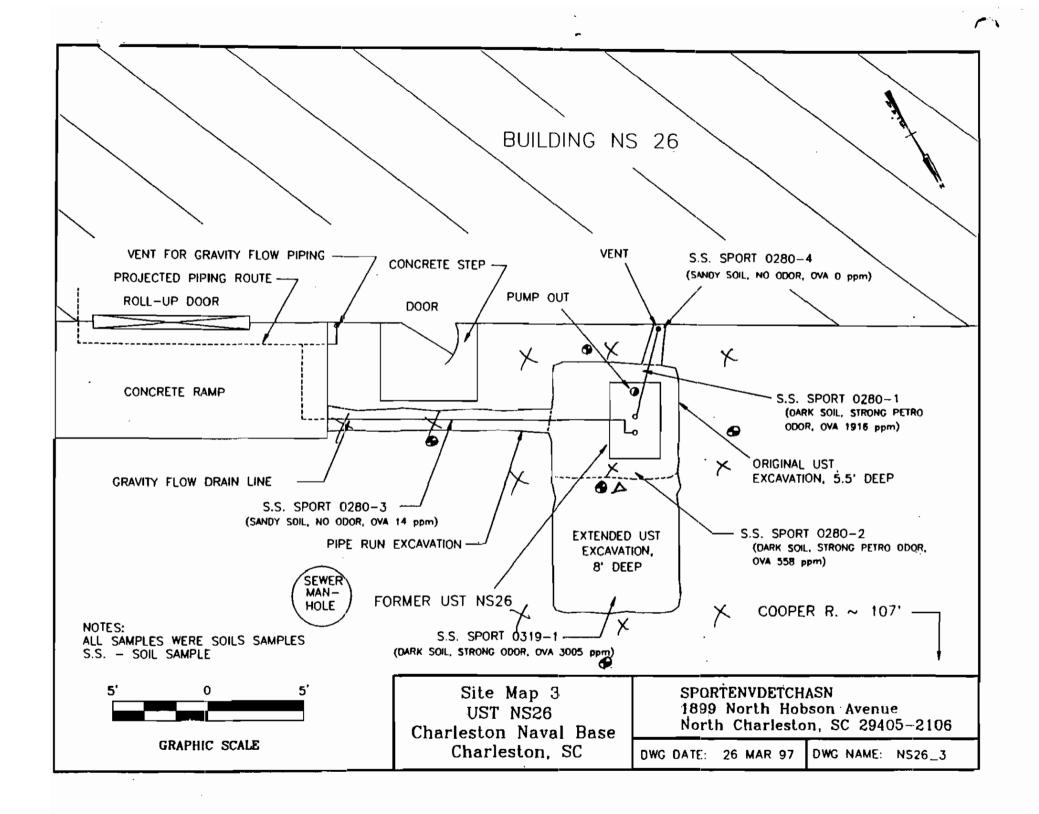
SITE MAP

You must supply a scaled site map. It should include all buildings, road names, utilities, tank and pump island locations, sample locations, extent of excavation, and any other pertinent information.

Site Maps 1, 2, and 3 Photographs 1 and 2







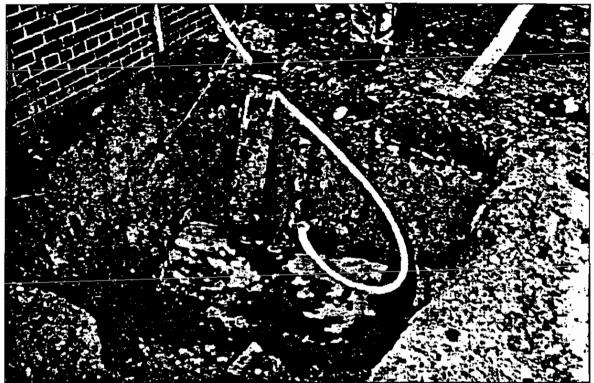


Photo 1: UST NS26 prior to removal.

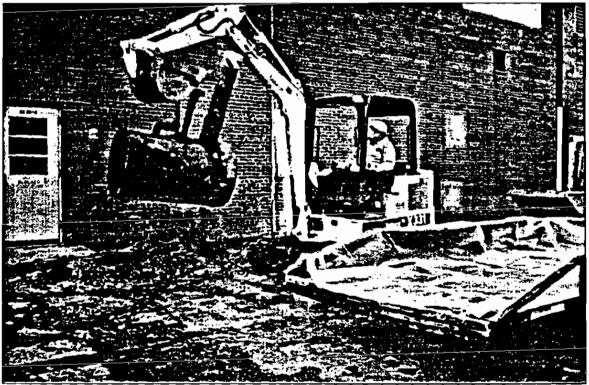


Photo 2: UST NS26 being removed.

Attachment II

ANALYTICAL RESULTS

You must submit the laboratory report and chain-of-custody form for the samples. These samples must be analyzed by a South Carolina certified laboratory.

Certified Analytical Results Chain-of-Custody



GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow:

Laboratory Cartification

PTATE FL NC SC TN OEL 287136/87294 BUCHINI 233 10120 10517 12534

B)B 26A

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portunouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portugath Detachment

oc: NPWC00196

Report Date: January 03, 1997

Page 1 of 3

Sample ID

: SPORT0280-1

Lab ID

: 9612398-01

Marrix

: Seil

Date Collected

: 12/13/96

Date Received

: 12/13/96

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Remit	DL	RL	Units	DF	ولعمد	st Date	Time	Batch	M
Volatile Organics			-			_					
BTEX - 4 nams											
Benzene	ព្	0.00	1000	2000	ug/kg	1000	MKP	12/31/96	1736	95377	1
Ethylbentene	Ū	0.00	1000	2000	DE/AL	1000					
Toluene	ប	0.00	1000	2000	ug/kg	1000					
Xylenes (TOTAL)		3980	1000	2000	ug/kg	1000					
Nephthalene		95700	1000	2000	Ug/Kg	1000					
Extractable Organics					- •						
Polynuclear Aromatic H	ydrocarbons -	. 16 ப் சா ச									
Accrephthene	U	0.00	1640	3270	ug/kg	10.	JCE	12/30/96	1956	95357	2
Acenaphibylene	ប	0.00	1640	3270	ug/kg	10.					
Anthrocne	U	0.00	1640	3270	ug/kg	10.					
Benzo(a)anthracene	ប	0.00	1640	3270	ug/kg	10.					
Bonzo(a)pyrene	Ü	0.00	1640	3270	Ug/Icg	10.					
Benzo(b)fluorenthene	บ	0.00	1640	3270	ng/kg	10.					
Benzo(ghi)perylene	U	0.00	1640	3270	ng/cg	10.					
Berzo(k)fhorenthese	บ	0,00	1640	3270	DE/EE	10.					
Chrysens	บ	0.00	1640	3270	ug/kg	10.					
Dibenzo(a_h)anthracene	ប	0.00	1640	3270	ng/kg	10.					
Flucranthens	. บ	0.00	1640	3270	ug/eg	10.					
Florence	υ	0.00	1540	3270	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	1640	3270	ug/kg	10.					
Nuphthalene		69300	6540	13100	ug/kg	40.	ICB	12/31/96	1220	95357	2
Phenanthrens	ט	00.0	1640	3270	ug/kg	10.	1CB	12/30/96	1956	95357	2
Pyrone	ប	00.0	1640	3270	ug/kg	10.					
Metals Analysis					- "						
Mercury	J	0.0530	0.00243	0.200	mg/cg	1.0	CRB	12/20/96	1822	95304	N
Silver	1	612	41.6	980	ug/kg	2.0	NRM	12/30/96	2036	95307	3
Amenic		3240	270	980	THE ALE	2.0					

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GENERAL ENGINEERING LABORATORIES

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DM 517472/87438 以名名以 BI7154A7294 133 10712 02914 10120

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Partemouth Departument-Env.

1899 North Holson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hism

Project Description:

SUPSHIP-Portunicath Detachment

c: NPWC00196

Report Date: January 03, 1997

Page 2 of 3

	Sample II)	: SPORT0280-1								
Parameter	متعاررة.	Result	DL	RL	Units	DF	Abaly	st Date	Thos	Betch	M
Baritan		23600	24.2	980	ne/ke	2.0					
Cadmium		6180	20.5	490	ng/gg	2.0	NRM	12/30/96	2036	95307	3
Chromium		127000	60.9	980	werke.	2.0					
Losd		239000	134	490	DE/KE	2.0					
Sclenium	3	234	223	490	ug/kg	2.0					
General Chemistry											
Total Rec. Petro. Hydroca	rbons	4960	10.0	50.0	mg/kg	1.0	SLR	12/20/96	1200	95329	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

Mercury

TRACE

MS 12/26/96 1300 95357 5 CRB 12/19/96 1830 95304 6 FGD 12/19/96 2000 95307 7

Surrogute Recovery	Test	Percent%	Acceptable Limits	
2-Pluombiphenyl	M610	0.00*	(30.0 - 115.)	
Nitroberzene-d5	M610	108.	(23.0 - 120.)	
p-Te spisen yl-d14	M610	0.00*	(37.3 - 128.)	
Bromofluorobenzene	BTEX-8260	98.9	(53.5 - 154.)	
Digramofluoromethaus	BTEX-8260	114.	(63.4 - 136.)	
Tolvens-d8	BTEX-8260	107.	(72.1 - 137.)	
Втопой чоговелица	NAP-8260	98.9	(53.5 - 154.)	
Dibromo (buoromediane	NAP-8260	114.	(63.4 - 136.)	
Tolvens-d8	NAP-8260	107.	(72.1 - 137.)	

M = Method	Method-Description	
M I	EPA 8260	
M 2	EPA 5270	
M3	EPA 6010A	
M4	EPA 9071	
MS	EPA 3550	

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GENERAL ENGINEERING LABORATORIES

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Laboratory Cartiflant STATE B17472/17451 E87154-87264 10512 02924

Ches

Supervisor of Ship Building & Convenion

SUPSHIP-Portunouth Detachment-Env.

1899 North Hobson Ave.

North Charleson, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detectment

c: NPWC00196

Report Date: Jammery 03, 1997

Pure 3 of 3

	Sample ID	: SPORT0280-1	
M = Method		Method-Description	
M 6	<u></u> _	EPA 7471	
M 7		EPA 3050	

Notes

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the enalyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Luborancies standard operating procedures. Please direct eny questions to your Project Manager, Karen Blokenay at (803) 769-7386.

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indicutes that a quality control analyse recovery is outside of specified acceptance criteria.



Meeting today's needs with a vision for tomorrow.

Laboratory Cartifications

Clienz

Supervisor of Ship Building & Conversion

SUPSHIP-Portamouth Detachment-Eav.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

œ: NPWC00196

Report Date: January 03, 1997

Page 1 of 3

Sample ID

: SPORT0280-2

Lab ID

:9612398-02

Manix
Date Collected

: Soil

Dan Constituti

: 12/18/96

Date Received

: 12/18/96

Priority

: Routing

Collector : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Apaly	et Date	Time	Batch	M
Volatile Organics								<u> </u>		•	
BTEX - 4 items											
Benzene	บ	0.00	10.0	20.0	ug/Eg) 0.	MXP	12/31/96	1804	95377	1
Ethylbenzene	U	0.00	10.0	20.0	ug/xg	10.					
Toluene	บ	0.00	10.0	20.0	Dg/kg	10.					
Xylenes (TOTAL)		196	10.0	20.0	ng/kg	10.					
Nophthalene		1410	20.0	40.0	uu/kg	20.	MKP	12/31/96	2154	95377	1
Extractable Organics											
Polynuclear Aromatic H	ydrocarbons -	16 tems								•	
Acenaphthene	ับ	0.00	2470	4930	ug/kg	10.	JCB	12/30/96	2030	95357	2
Accomphitylene	υ	0.00	2470	4930	ug/kg	10.					
Anthreens	υ	0.00	2470	4930	ие/ка	10.					
Benzo(a)anthracene	υ	0.00	2470	4930	ug/kg	10.					
Benzo(a)pyrone	U	0.00	2470	4930	ug/kg	10.					
Benzo(b)finoranthene	บ	0.00	2470	4930	ug/kg	10.					
Benzo(ghi)perylene	U	0.00	2470	4930	vg/kg	10.					
Benzo(k)/Juorenthere	U	0.00	2470	4930	ug/xg	10.					
Chrysene	U	0.00	2470	4930	ug/kg	10.					
Dibenzo(a,h)anthracens	U	0.00	2470	4930	ug/kg	10.					
Fluctrumbene	บ	0.00	2470	4930	ng/kg	10.					
Fluoresc	v	0.00	2470	4930	ng/kg	10.					
Indeno(1,2,3-c,d)pyrene	U	0.00	2470	4930	ns/rg	10,					
Naphthalene		15100	2470	4930	ug/kg	10.					
Phonenthrene	บ	0.00	2470	4930	ug/kg	10.					
Pyrene	υ	0.00	2470	4930	ug/kg	10.					
Metala Analysis											
Mercury	3	0.0511	0.00246	0.200	mg/kg	1.0	CRB	12/20/96	1825	95304	N
Silver	3	881	42.0	990	ug/kg	2.0	NRM	12/30/96	2041	95307	3
Arsenic		3580	273	990	ug/kg	2.0					

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watery Cartification STATE OF E97) 54/87294 25.26 223) 19126 10113

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portamouth Detachment-Env.

1899 North Holson Ave.

North Charleson, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

ca: NPWC00196

Report Date: January 03, 1997

Page 2 of 3

	Sample II)	: SPORTU280-2								
Parameter	Qualifier	Result	DL	ŘĹ	Ünite	DF	Analy	st Date	Time	Butch	,x
Berium		32700	24.5	990	ng/kg	2.0					
Cadmium		8800	20.7	495	w/kg	2.0	NAM	12/30/96	2041	95307	3
Chromium		148000	61.5		ug/kg	2.0					
Land		331000	135	495	ughe	2.0					
Selatium	J	335	226	495	ug/kg	2.0					
General Chemistry											
Total Rec. Petro. Hydro	carbons	15900	10.0	50.0	myks	1.0	SLR	12/20/96	1200	95329	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

Mercury

TRACE

MS 12/26/96 1300 95357 5 CRB 12/19/96 1830 95304 6 FGD 12/19/96 2000 95307 7

Surrogate Recovery	Test	Percent S	Acceptable Limits	
2-Phorobiphenyl	M610	165.*	(30.0 - 115.)	
Nitrobenzene-d5	M610	180	(23.0 - 120.)	
p-Terphenyl-d14	M610	153.4	(37.3 - 128.)	
Bromofluorobenzara	BTEX-8260	70.1	(53.5 - 154.)	
Dibramolluoromethane	BTEX-8260	102.	(63.4 - 136.)	
Talwese-d8	BTEX-8260	99.9	(72.1 - 137.)	
anstradorou il orror di	NAP-8260	70.1	(53.5 - 154.)	
Dibromofluoromethana	NAP-8260	102.	(63.4 - 136.)	
Toluens-d8	NAP-8260	99.9	(72.1 - 157.)	

M = Method	Mathod-Description	
M1	EPA \$250	
M2	EPA \$270	
М3	EPA 6010A	
М4	EPA 9071	
M5	EPA 3550	

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°9612398-02°



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STATE COL 104 1037472/07451 江北北江 E27156#7704 223 10120 10512 02934 02934

عصنت

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 North Holson Ave.

North Charleson, Spath Carolina 29405-2106

Coppet

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cz: NPWC00196

Report Date: Jamesy 03, 1997

Page 3 of 3

	Sumple 1D	: SPORT0280-2	
M = Method		Method-Description	
М 6		EPA 7471	
M 7		EPA 3050	

Notes

The qualifiers in this raport are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of gnalyte at a concentration loss than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyse was not detected at a concentration greater than the detection limit

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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9612398-02



indicates that a quality control analyze recovery is outside of specified acceptance criteria.



Meeting today's needs with a vision for tomorrow.

Lateratory Cartification OEL. EFT 217472/81451 E8713647294 233 10120 10322 **C2934 CE734**

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portugorth Detectment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portemouth Detachment

CE NPWC00196

Report Date: January 03, 1997

Page 1 of 3

Sample ID

: SPORT0280-3

LabID Maria

: 9612398-03 : Sail

Date Collected

: 12/18/96

: 12/18/96

Date Received

Priority

: Routing

Collector

: Client

Parameter	Qualifier	Remit	DŁ	RL	Units	DF	Analy	at Dute	Time	Botch	M
Volatile Organics											
DTEX -4 items											
Вепавна	ŭ	00.0	1.00	200	ug/kg	1.0	MKP	12/31/96	1833	95377	1
Ethylbennes	Ū	00.0	1.00	200	ug/kg	1.0					
Toluene	ប	0.00	1.00	200	ug/kg	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/kg	1.0					
Naphthalene	J	1 <u>.22</u>	1.00	200	ug/kg	1.0					
Extractable Organics					•						
Polynuclear Aromatic H	lydrocarbons -	16 isems									
Acenephthene	Ü	0.00	1660	3310	DE/EE	10.	JCB	12/30/96	2104	95357	2
Accomplishylene	Ŭ	0.00	1660	3310	m/eg	10.					
Arthracene	Ü	0.90	1660	3310	ug/kg	10.					
Benzo(a)andraoene	υ	0.00	1660	3310	ug/kg	10.					
Benzo(a)pyrene	บ	0.00	1660	33 10	ug/kg	10.					
Benzo(b) Suprantingo	Ŭ	0.00	1660	3310	ug/kg	10.					
Benzo(ghi)perylene	Ü	0.00	1660	3310	ug/kg	10.					
Berm(k)fluorantiene	Ŭ	00.0	1 660	3310	WE/KE	10.					
Citysene	บ	0.00	1660	3310	ue/kg	10.					
Diberzo(a,h)szibracene	U	0.00	1660	3310	UE/ICE	10.					
Fluorenthene	Ŭ	0.00	1660	3310	ng/cg	10.					
Pluorene	Ŭ	0.00	1660	3310	ug/kg	10.					
Indeno(1,2,3-c,d)pyrene	ט	0.00	1660	3310	ug/gg	10.					
Naph thalene	Ù	0.00	1660	3310	ve/kg	10.					
Phonenthrene	U	0.00	1660	3310	DE/KE	10.					
Рутице	บ	00.0	1660	3310	ng/kg	10.					
Metate Analysis											
Метему	J	0.0182	0.00243	0.200	TOE/EE	1.0	CRB	12/20/96	1827	95304	N
Silver	U	-32.4	40.5	962	ng/kg	2.0	NRM	12/30/96	2132	95307	3
Anenic		2600	265	962	ug/kg	2.0					

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9612398-03

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Meeting today's needs with a vision for townsrow.

Laboratory Curtifications

STATE CEL 291
PL ESTILSATZSA ESTATZUTASS
NC 233
SC 10120 105312
TN U28M 02804

Char

Supervisor of Ship Building & Conversion

SUPSRIP-Portemouth Detechment-Env.

1899 North Hobson Ave.

North Charleson, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Purumouth Detachment

ec: NPWC00196

Report Date: January 03, 1997

Page 20[3

	Sample ID		: SPORT0280-3								
Parameter	Queliller	Result	DL	RL	Ú nits	DF	Analy	st Date	Time	Batch	M
Buinn		14400	23.8	962	ug/kg	2.0					_
Cadminan	U	18.9	20.1	481	pg/kg	2.0	NRM	12/30/96	2132	95307	3
Chromium		9550	59. 7	962	DE/EE	2.0					
Lead		15000	131	481	ng/kg	2.0					
Selenium	U	3.09	219	481	un/Kg	2.0					
General Chemistry											
Total Rec. Petro. Hydroca	apoer	310	10°D	402	mg/kg	1.0	5LR	12,20/96	1200	95329	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

Mercury TRACE

1

MS 12/26/96 1300 95357 5 CRB 12/19/96 1830 95304 6 PGD 12/19/96 2000 95307 7

Surrogate Recovery	Test	Percent%	Acceptable Limits
2-Fluorobiphenyl	M610	0.00-	(30.0 - 115.)
Nitrobenzene-45	M610	0.00*	(23.D - 120.)
p-Terphenyl-d14	M610	0.00℃	(37.3 - 128.)
Bromofluorobensone	BTEX-8260	101.	(53.5 - 154.)
Dibromofluoromethane	BTEX-8260	99.2	(63,4 - 136.)
Toluens-da	BTEX-\$250	9 0.1	(72.1 - 137.)
Bromofluorobenzene	NAP-8260	101.	(53.5 - 154.)
Dibromofluoremethane	NAP-8260	99.2	(63,4 - 136.)
Toluena-d8	NAP-8260	90.1	(72.1 - 137.)

M = Method	Method-Description	
MI	EPA \$260	
M2	EPA 8270	
M3	EPA 6010A	
M4	EPA 9071	
M5	EPA 3550	

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961239B-03

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Meeting tuday's needs with a vision for tumorrow.

STATE GET 2017) MAY 7204 233 10120 10512

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portmouth Detachment-Env.

1899 North Hobson Ave.

North Charleson, South Caroline 29405-2106

Cornect

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

a: NPWC00196

Report Date: January 03, 1997

Page 3 of 3

02534

	Sample ID	: SPORT0280-3	
M = Mathed		Method-Description	
М 6		EPA 7471	· · · · · · · · · · · · · · · · · · ·
M7		EPA 3050	

Nom:

The qualiflers in this report are defened as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of enalyse at a consenuration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the malyte was not described at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Flouse direct

any quastions to your Project Manager, Karen Blakeney at (803) 769-7386.

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9612398-03



Princed our scarpidal paper.

indicates that a quality control analyse recovery is outside of specified acceptance criteria.



Meeting today's needs with a vision for tomorrow.

STATE CEL 以北京 211472/11451 DIT 54/17294 200 10130

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Persmouth Detechment-Env.

1899 North Hobson Ave.

North Charleston, South Caroline 29405-2106

Contact

Mr. Bill Hissa

Project Description:

SUPSHIP-Portsmouth Detechment

cc: NPWC00196

Report Due: January 03, 1997

Page 1 of 3

Sample ID

Lab ID

: SPORT0280-4 : 9612398-04

Matrix

: ŠoÜ

Date Collected

: 12/18/96

Date Received

: 12/18/96

Prioricy

: Routine

Collector

: Client

Parameter	Qualifler	Result	DL	RL	Units	DF	Analyst Date	Time	Butch	M
Volatile Organics										
BIEZ -4 items										
Benzene	נו	0.00	1.00	2.00	UE/KS	1.0	MKP 12/31/9	6 1901	95377	1
Ethylbenzene	บ	0.00	1.00	2.00	ug/kg	1.0				
Tolmens	บ	0.00	1.00	2.00	ug/kg	1.0				
Xylenes (TOTAL)	บ	0.00	1.00	4.00	ug/kg	1.0				
Nephthalene	U	0.840	1.00	2.00	ug/kg	1.0				
Extractable Organics					• •					
Polynuciear Aromatic H	ydrocarbons -	. 16 items								
Accusphulene	ับ	0.00	1640	3280	up/kg	10.	JCB 12/30/9	6 2137	95357	2
Acenephthylene	Ü	0.00	1640	3280	DE/KE	10.				
Anthracune	Ū	0.00	1640	3280	ug/kg	10.				
Benzo(a)antivacene	U	0.00	1640	3280	ne/kg	10.				
Велдо(в)ругеле	U	0.00	1640	3280	UE/KE	10.				
Benzo(b)fluorantheno	נו	0.00	1640	3290	uz/ke	10.				
Bonzo(ghi)perylene	U	0.00	1640	3280	THE RE	10.				
Benzo(k)fluoranthene	U	0.00	1640	3280	ug/kg	10.				
Chrysens	Ü	0.00	1640	3280	ug/kg	10.				
Diberzo(a,h)anthracene	ט	0.00	1640	3280	ug/kg	10.				
Fluoranthene	บ	0.00	1640	3280	ug/Eg	10.				
Plucrene	บ	0.00	1640	3280	VE/KB	10.				
Indeno(1,2,3-c,d)pyrene	บ	0.00	1640	3280	DE/EE	10.				
Naphthalene	U	0.00	1640	3280	ug/kg	10.				
Phenenthrene	U	0.00	1640	3280	ug/kg	10.				
Pyrone	บ	0.00	1640	3280	UE/KE	10.				
Tetule Anniyale										
Marcury	1	0.0269	0.00347	0.200	mg/kg	1.0	CRB 12/20/9	6 1830	95304	N
Silver	Ţ	311	42.0	990	ug/kg	2.0	NRM 12/30/9	6 2137	95307	
Amenic	_	4890	273	990	ug/kg	2.0				

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9612398-04



Meeting today's needs with a vision for competent

STATE CEL en Enanat \$17194/\$72M 237 10120 10522

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detechment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

cc: NPWCD0196

Report Date: January 03, 1997

Page 2 of 3

	Sample III	1	: 5PORTU280-4								
Parameter (بطالاده	Result	DL	RL	Units	DF	Analy	nt Date	Time	Batch	M
Berium		17500	24.5	990	ne/kg	20					
Cadmium		3090	20.7	495	w.kg	2.0	NRM	12/30/96	2137	95307	3
Chromium		110000	61.5	990	ng/kg	2.0					
Load		93600	135	495	ne/me	2.0					
Saleninm	J	448	225	495	uz/kg	2.0					
General Chemistry									,		
Total Roc. Petro. Hydrocan	POOL	550	10.0	50.0	mg/kg	1.0	SLR	12/20/96	1200	95329	4

The following prep procedures were performed:

GCMS Base/Neggal Compounds

Marcury TRACE

MS 12/26/96 1300 95357 5 CRB 12/19/96 1830 95304 6 PGD 12/19/96 2000 95307 7

Surrogate Recovery Test Percent% Acceptable Limits 2-Fluorobiphonyl M610 100. (30.0 - 115.) Nitrobergeme-d5 M610 0.00* (23.0 - 120.) 0.00* p-Terphenyl-d14 M610 (37.3 - 128.)Bromofluorobenzene BTEX-8260 109. (53.5 - 154.) Dibronofluoromethene BTEX-8260 100. (63.4 - 136.)Toluens-di BTEX-\$250 97.7 (72.1 - 137.)Bronnefluorebenzene NAP-8260 109. (53.5 - 154.) Dibronofhuronethme NAP-8260 100. (63.4 - 136.) Toluene-di NAP-8260 97.7 (72.1 - 137.)

M = Method	Method-Description	
M1	EPA 8260	
M 2	EPA 8270	
M3	EPA 6010A	
M4	EPA 9071	
M5	EPA 3550	

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9612398-04



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Meeting today's needs with a vision for unnormal

STATE GEL ET ETHRATIRA E8713W87294

Client:

Supervisor of Ship Building & Conversion

SUPSHIP-Poramouth Deuchmani-Env.

1899 North Hobson Ave.

North Charleson, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Deuchment

C: NPWCD0196

Roport Date: January 03, 1997

Page 3 ec 3

	Sample ID	: SPORT0280-4		
M = Method		Method-Description		
M 6		EPA 7471	,	
M7		EPA 3050		

None

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not desected at a concentration greater than the detection limit.

I indicates presence of malyes at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions so your Project Menager, Karen Blakency at (803) 769-7386.

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-0612398-04*



indicates that a quality control enalyte recovery is outside of specified acceptance criteria.



Meeting index's needs with a vision for tomorthy.

Leteroloty Cartifications

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 OBL
 EFT

 PL
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 807677

 NC
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 10982

 BC
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 10982

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 4654
 02894

Cllent

Supervisor of Ship Building & Convenies

SUPSHIP-Portsmouth Deutchmant-Env.

1899 North Hobson Ave.

North Charleson, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

c NPWC00196

Report Date: Jamery 03, 1997

Page 1 of 3

Sample ID

: SPORT0280-5

LabID

:9612398-05

Martin

: Soil

Data Collected

: 12/18/96

Date Received

: 12/18/96

Priority

: Rogtine

Collector

Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst Del	n Time	Betch	M
Voletija Organies										
BTEX -4 isams					•					
Benzene	U	20.0	1000	2000	top/kg	1000	MKP 12/31	96 1929	95377	1
Ethylbenzene	U	0.00	1000	2000	ug/ky	1000				
Tolucne	U	0.00	1000	2000	ug/kg	1000				
Xylenes (TOTAL)	U	0.00	1000	2000	ug/kg	1000				
Naphthalene	J	1260	1000	2000	ug/kg	1000				
Extractable Organics										
Polynuclear Aromatic h	tydrocar bonu	· 16 items								
Acenaphthene	U	00.0	1630	3250	ug/kg	10.	JCB 12/30	796 2211	95357	2
Accomplishylene	U	0.00	1630	3250	DE/EE	10.				
Anthracene	บ	0,00	1630	3250	ug/kg	10.				
Benzo(a) enthronne	U	0.00	1630	3250	ug/kg	10.				
Венго(в)ругеле	U	0.00	1630	3250	HE/KE	10.				
Berzo(b)fluorenthene	U	0.00	1630	3250	ug/kg	10.				
Barzo(ghi)perylene	ņ	0.00	1630	3250	14/44	10.				
Besze(k)Os vienihene	บ	0.00	1630	3250	ME/KE	10.				
Chrysene	. ប	0.00	1630	3250	ug/kg	10.				
Dibenzo(a.h)entracene	υ	20. 0	1630	325 0	ug/kg	10.				
Fluoranthena	บ	0.00	1630	3250	ug/kg	10.				
Fluorenc	บ	0.00	1630	3250	ng/kg	10.				
Indeno(1,23-cd)pyrene	ប	0.00	1630	3250	ug/kg	10.				
Naphthalene		8450	1630	3250	ng/kg	10.				
Phenanthrese	U	20.0	1630	3250	PE/KE	10.				
Pyrone	U	0.00	1630	1250	TTE/ES	10.				
Metala <u>Anaiyala</u>			- -							
Mercury	j	0.0259	0.00246	0.200	mg/kg	1.0	CRB 12/20	/96 1832	95304	N
Süver	1	91.6	41.6	980	Ug/kg	2.0	NRM 12/30	/96 2142	95307	3
Ansanie		3090	270	980	HE/KE	2.0				

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Meeting tuday's needs with a vision for monorms.

STATE CEL NKKI. 28713647294 ESTATIANTASI 10120 10543 12734

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detrichment-Env.

1899 North Holson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiera

Project Description:

SUPSHIP-Pontamouth Detachaneau

c NPWC00196

Report Data: Jamary 03, 1997

Page 2 of 3

	Sample ID	1	: SPORT0280-5	_					•		
Parameter	Smettlet.	Remit	DL	RL	Units	DF	Analy	et Date	Time	Belch	м
Barina		17400	24,2	980	ve/ks	20					
Cedenium		655	20.5	490	ug/kg	2.0	NRM	12/30/96	2142	95307	3
Ciromium		22:200	60.9	980	ug/kg	2.0					
Lead		51600	134	490	ug/kg	2.0					
Selenium	ប	-30.7	223	490	vg/kg	2.0					
General Chemistry											
Total Roc. Petro, Hydroca	rbons	1780	10.0	50.0	mg/kg	1.0	SLR	12/20/96	1200	95329	4

The following prep procedures were performed:

GC/MS Base/Neural Compounds

TRACE

Mercury

MS	12/25/96	1300	95357	5
CRE	12/19/96	1430	95304	6
FGD	12/19/96	2000	95307	7

Surrogate Recovery	Test	Percent%	Acceptable Limits	
2-Fluoroblphenyl	M610	0,00*	(30.0 - 115.)	
Nitrobenzene-dS	M610	0.00*	(23.0 - 120.)	
p-Terphenyl-d14	M610	0.00*	(37.3 - 128.)	
Bromofinorobenzena	BTEX-8260	98.2	(53.5 - 154.)	
Dibromofiuoromethene	BTEX-8260	106.	(63 <i>A</i> - 136.)	
Tolume-d8	BTEX-8260	99.2	(72.1 = 137.)	
<u>nametjaanopename</u>	NAP-8260	98.2	(53.5 - 154.)	
Dibromofluoromethens	NAP-8260	106.	(63.4 - 136.)	
Toluena-di	NAP-8260	99.2	(72.1 - 137.)	

M = Method	Method-Description	
MI	EPA \$260	
M 2	EPA 8270	
M 3	EPA 6010A	
M4	EPA 9071	
M 5	EPA 3550	

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9612398-05



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CEL. 307156/07204 EE7472/87458

10120

10512 D034

Client

Supervisor of Ship Building & Convention

SUPSHIP-Ponemouth Demchmant-Env.

1899 North Hobson Ave.

North Charlemon, South Carolina 29405-2106

Correct

Mr. Bill Hiers

Project Description:

SUPSHIP-Ponsmonth Detechment

œ: NPWC00196

Report Date: January 03, 1997

Page 3 of 3

	Sample ID	; SPORT0280-5	
M = Method	_	Walfog-Description	
M 6		EPA 7471	
M7		EPA 3050	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyse was not detected at a concentration greater than the detection limit,

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyse was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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9612398-05



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indicates that a quality control analyte recovery is outside of specified acceptance enhants.



Meeting today's needs with a vision for immerrow.

Loboratory Cartification

STATE GEL FL EFTIS NC 273 SC 10120 TN 0254 EPI E87472/87458 E87154-07294

10582 02934

Clien:

Supervisor of Ship Building & Conversion

SUPSHIP-Portamouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiert

Project Description:

SUPSHIP-Portsmouth Detachment

ce: NPWC00196

Report Date: January 02, 1997

Page 1 of 2

Sample ID

: SPORT0280-6

LabID

: 9612398-06 : GroundH2O

Matrix Data Collected Date Received

: 12/18/96 : 12/18/96

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	BL	Units	DF	Anal	yst Date	Time	Batch	м
Volatile Organics											
BTEX - 4 itame											
Benzene	บ	0.00	1.00	2.00	ug/l	1.0	JAC	12/30/96	1614	95615	1
Ethylherment	บ	0.00	1.00	2.00	11g/1	1.0					
Toluene	U	0.00	1.00	2.00	ug/l	1.0					
Xylenes (TOTAL)	U	0.00	1.00	4.00	ug/l	1.0					
Naphthalens	U	0.00	1.00	2.00	ug/l	1.0					

Surrogate Recovery	Test	Percent%	Acceptable Limits
Bromofinorobenzene	BTEX-8260	101.	(73.8 - 128.)
Dibremofinaremethene	BTEX-8260	107.	(63.9 - 139.)
Tolume-d8	BTEX-8260	104.	(77.1 - 121.)
Bromo fluorobenzane	NAP-8260	101.	(73.8 - 128.)
Dibromofluoromethme	NAP-8260	107.	(63.9 - 139.)
Toluena-d8	NAP-8260	104.	(77.1 - 121.)

M = M ethod	Method-Description	

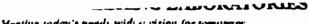
M 1 **EPA 8260**

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9612398-069





Meeting today's needs with a vision for tomorrow.

Œ E17156/27294 DE7472/87458 10120 10312 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portamouth Detachment-Env.

1899 North Hobson Ave.

North Charleston, South Caroline 29405-2106

Contact

Mr. Bill Kiers

Project Description:

SUPSHIP-Portsmouth Detechment

cc: NPWC00196

Report Date: Jamesry 02, 1997

Page 2 of 2

Sample ID

: SPORT0280-6

M = Method

Method-Description

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyse at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

indicates that a quality control analyte recovery is outside of specified acceptance crimeia.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories tenderd operating procedures. Please direct city questions to your Project Manager, Karen Blakency at (803) 769-7386.

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20417208 Ace



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Leberatory Cartifications
ITATE GALL BYT
FL EXTISSATION EXTAGATOR
IC 200

(1987) (1987) 10130 (1987) 329

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Ponsmouth Detachment-Edv.

1899 North Hobson Ave.

North Charleson, South Carolina 29405-2106

Contact

Mr. Bill Hien

Project Description:

SUPSHIP-Portsmouth Desichment

cc: NPWC00196

Report Date: Jessary 03, 1997

Page 1 of 2

Sample ID
Leb ID
Marrix
Date Collected
Data Received

: SPORTU280-7 : 9612398-07 : Soil : 12/18/96 : 12/18/96

Priority Collector : Routine : Client

Parameter	Qualifler	Result	DL	RI.	Cale	DF	Analyst Date	Time	Batch	Ж
Voiatile Organics										
BTEX - 4 isoms										
Benzene	U	0.00	1.00	2.00	UE/KE	1.0	MIKP 12/31/9	5 2222	95377	1
Ethylbertens	U	0.00	1.00		ug/kg	1.0				
Toluene	Ü	0.00	1.00		ug/kg	1.0				
Xylenes (TOTAL)	ט	0.00	1.00	4.00	ng/kg	1.0				
Naphthalassa	1	1.44	1.00	2.00		1.0				

Sarrogute Recovery	Test	Percent%	Acceptable Limits	
Bromofluorobenzene	BTEX-8260	107.	(53.5 - 154.)	
Dibromofhacromediana	BTEX-8260	113.	(63.4 - 136.)	
Tolurne-di	BTEX-8260	106.	(72.1 - 137.)	
Bromollworobenzena	NAP-8260	107.	(53.5 - 154.)	
Dibromofhioromethens	NAP-8760	113.	(63.4 - 136.)	
Taluane-då	NAP-8260	106.	(72.1 - 137.)	

M = Method	Method-Description

Μı

EPA 8260

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9612398-07



Meeting today's needs with a vision for tomorrow.

LABORATORY CARTERINA

STATE (22). 201

PL 187115/87294 217/02/87451

NC 221

SC 10120 10583

TN 02094 22154

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Personouth Deuchmant-Env.

1899 North Hobson Avc.

North Charleson, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

a: NPWC00196

Report Date: January 03, 1997

Page 2 of 2

Saurie ID

: SPORT0280-7

M = Method

Method-Description

Notes

The qualifiers in this report we defined as follows:

ND indicates that the analyse was not detected at a concentration greater than the detection limit.

J indicates presence of analyze at a concentration less than the reporting limit (RL) and greater than the detection limit (OL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance exiteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Keren Blakettry at (803) 769-7386.

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9612398-07



WEIVY VUITO

General Engin Carolina 29414
P.O. Box 30712
Charleston, South Carolina 29417

(803) 556-8171

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White = sample collector

Yellow = file

Pink = with report



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Laboratory Cartifications STATE CEL 九米記 B1713647294 BIT-672/87450 10120 10511 (B) M

Cliest

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detechment-Env.

1899 North Hobson Ave.

North Charleston, South Carolina 29405-2106

Contact:

Mr. BII Hiers

Project Descripcion:

SUPSHIP-Portamouth Detechment

a:: NPWC00196

Report Date: February 04, 1997

Page 1 of 3

Sample ID LabID

: SPORT0319-1

:9701462-01

Manix

: 5=2

Date Collected

: 01/24/97

Date Received

: 01/24/97

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	st Deta	Time	Butch	M
Votetile Organies							_				
BTEX - 4 lizar											
Berzene	Ü	0.00	500	1000	mb/c2	500	JAC	01/29/97	2106	97025	1
Ethylbenzens	U	0.00	500	1000	ug/kg	500					
Toluene	J	510	500	1000	ug/kg	500					
Xylenes (TOTAL)		1080	500	1000	ug/kg	500					
Naphthalane		18400	500	1000	ug/kg	500					
entractable Organics											
Polynuclear Aromatic Li	lydrocarbons	- 15 items									
Accumpathene	ับ	0.00	652	1300	ug/kg	4.0	JCB	01/31/97	1358	96935	2
Acenaphthylene	บ	0.00	652	1300	ug/kg	4.0					
Anthrome	υ	0.90	652	1300	ug/kg	4.0					
Benzo(s)anilyacene	บ	0.00	652	1300	ueke	4.0					
Вепло(в)ругено	U	0.00	652	1300	ug/kg	4.0					
Berzo(b)fluoranibens	บ	0.00	652	1300	ug/kg	4.0					
Benzo(ghi)perylana	ប	0.00	652	1300	ug/kg	4.0					
Benzo(k) fluoranthane	บ	00.0	652	1300	ug/kg	4.0					
Стузете	บ	0.00	652	1300	11/23	4.0					
Dibenzo(a,h)anthracene	U	0.00	632	1300	ug/kg	4.0					
Fluorenthene	บ	0.00	652	1300	ug/kg	4.0					
Fluorene	υ	0.00	652	1300	ng/kg	4.0					
Indeno(1,2.3-c.d)pyrone	י ט	0.00	652	1300	ng/kg	4.0					
Naphthalene		15100	652	1300	ug/kg	4.0					
Phonontheme	U	0.00	652	1300	ug/kg	4.0					
Ругине	บ	0.00	652	1300	UE/KE	4.0					
Zatala Analysis	-	· -			•						
Mascury	U	-0.00130	0.00241	0.200	mg/kg	1.0	RMJ	01/28/97	1646	96950	N
Silver	Ū	31.4	39.4	934	UE/EE	2.0	NRM	01/28/97	1831	96283	3
Americ	_	3960	258	934	DE/KE	2.0					

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9701462-01



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Laboratory Cartification

 STATE
 CPL
 EPT

 PL
 E87154/87294
 E17472/87453

 NC
 220
 EC
 10120
 18382

 TN
 02994
 02934

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Ponemouth Deschment-Env.

1899 North Hobson Ave.

North Charleson, South Carolina 29405-2106

Contact:

Mr. Bill Hiers

Project Description:

SUPSHIP-Ponymouth Detachment

c: NPWC00196

Report Date: February 04, 1997

Page 2 of 3

	2 milbje IT	•	: SPORTU319-1								
Parameter (Snemper	Remit	DL.	RL	Units	DF	Analy	at Date	Time	Batch	M
Barium		14200	23,1	934	ug/kg	20					
Cadmingra	J	427	19.5	467	ug/kg	2.0	NRM	01/28/97	1831	96883	3
Chromium		20300	58.0	934	ug/kg	2.0					
Laad		16000	127	467	ug/kg	2.0					
Schmium		504	213	467	DE/EE	2.0					
General Chemistry											
Total Rec. Patro. Hydroca	rbons	450	10.0	50.0	mg/kg	1.0	SLR	01/28/97	1100	96992	4

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

Mercury

TRACE

MS 01/27/97 0900 96935 5 CRB 01/27/97 1430 96950 6

PGD 01/27/97 1800 96883 7

Sarrogute Recovery	Test	Percent%	Acceptable Limits	_
2-Finoro biphonyl	M610	90.3	(30.0 - 115.)	
Nitrobenzeno-d5	M610	86.3	(23.0 - 120.)	
p-Terphenyl-d14	M610	93.5	(37.3 - 128.)	
Bromofluorobenzene	BTEX-8260	1 26 .	(53.5 - 154.)	
Olbromofluoromethine	BTEX-\$260	87.2	(63.4 - 136.)	
Toinens-d8	BTEX-8260	111.	(72.1 - 137.)	
Promofinaro banzans	NAP-6260	126.	(53.5 - 154.)	
Dibromofluoromethme	NAP-8260	87.2	(63 <i>A</i> - 136.)	
Toluene-d8	NAP-8260	111.	(72.1 - 137.)	

M = Method	Method-Description
M 1	EPA \$260
M2	EPA 8270
M3	EPA 6010A
M4	EPA 9071
MS	EPA 3550

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9701462-01



Frience on recycled pares.



Meeting inday's needs with a vision for temorray.

Laboratory Cartifications

FTATE CSL EM FL BE715487294 IG7472/67458 NC 193 SC 10130 16582 TN 02314 25514

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detachment-Env.

1899 Nurth Hobson Ava.

North Charleson, South Carolina 29405-2106

Contact

Mr. Bill Hier

Project Description:

SUPSHIP-Portsmouth Detachment

ce: NPWC00196

Report Date: February 04, 1997

Page 3 of 3

	Sample II)	: SPORT0319-1	
M = Mathad		Method-Description	
M 6 M 7		EPA 7471 EPA 3050	

Notes

The qualifiers in this report are defined as follows:

ND indicates that the analyse was not detected at a concentration greater than the detection limit.

indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the desection limit (DL).

I indicates that the analyte was not detected at a concentration greater than the detection limit.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Keren Blakensy at (803) 769-7386.

Blakens

Reviewed By

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Printal on recyclast popul.

+9701462-01*

^{&#}x27; indicates that a quality control analyse recovery is outside of specified acceptance criteria.



Meeting inday's needs with a vision for temperow.

Laboratory Cardiffeedings

FTATE OFL B71
FL B5715487284 B57472/87451
NC 223
BC 10120 10582
TN 02834 02834

Client

Supervisor of Ship Building & Conversion

SUPSHIP-Portsmouth Detechment-Env.

1899 North Holson Ave.

North Charleston, South Carolina 29405-2106

Correct

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmooth Detachment

c NPWC00196

Report Date: February 04, 1997

Page 1 of 2

Sample ID Lab ID : SPORTU319-2

Matrix

: 9701462-02 : <u>Soil</u>

Matrix Date Collected

: 01/24/97

Data Received Priority : 02/24/97 : Routine

Collector

: Client

Parameter	Graffjet.	Result	DL	RL	Units	DF	Analyst Date	Time	Batch	M
Volatile Organics					-					
BTEX - 4 items										
language .	Ü	0.00	1.00	200	no/es	1.0	JAC 01/31/9"	7 1510	97209	1
Ethylbenzene	ט	0.00	1.00	2.00	ויצ/גני	1.0				
Tolyana	Ü	0.00	1.00	2.00	ME/EE	1.0				
Aylenes (TOTAL)	U	0.00	1.00		ug/kg	1.0				
Naphthalena	ŭ	0.00	1.00		ug/kg	1.0				

Sarroyate Recovery	Test	Percent%	Acceptable Limits	
Bromofivorobenzene	BTEX-8260	91.6	(53.5 - 154.)	
Dibromofluquaethene	BTEX-8260	94.8	(63.4 - 136.)	
Toluene-d8	BTEX-5260	103.	(72.1 - 137.)	
Bromoffuorobenzana	NAP-8260	91.6	(53.5 - 154.)	
Dibromofivoromethere	NAP-8260	94,8	(63.4 - 136.)	
Toluene-d8	NAP-8260	104.	(72.1 - 137.)	

M = Method	•	Method-Description

Mı

EPA 8260

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-9701462-02-



Meeting today's needs with a vixion for tomorrow.

Laboratory Contification

E8715687284 E87472/17458

10120 10582 **(25)**4

CHear

Supervisor of Ship Building & Conversion SUPSHIP-Pontmouth Detachment-Env.

1899 North Holson Ave.

North Charleston, South Carolina 29405-2106

Contact

Mr. Bill Hiers

Project Description:

SUPSHIP-Portsmouth Detachment

Report Date: February 04, 1997

Page 2 of 2

Sample ID

: SPORT@19-2

M = Method

c: NPWC00196

Method-Description

None:

The qualifiers in this report are defined as follows:

ND indicates that the energies was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

indicama that a quality control analyte recovery is outside of specified acceptance criteria.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct erry questions to your Project Manager, Karen Blakeney at (803) 769-7386.

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9701462-02

N .300196

White = sample collector

CHAIN OF CUSTODY RECORD

_ns, Inc. General Engineering 2040 Savage Road Charleston, South Carolina 23414 P.O. Box 30712 Charleston, South Carolina 29417 (803) 556-8171

Page_____ of ______ 9701462 SAMPLE ANALYSIS REQUIRED (x) - use remarks aren to Client Name/Facility Name Use F or P in the boxes to indicate whether S PORTENYDETCHASN Collected by/Company CCL 25311 SPORTEN / DETCHASN TIME THE Remarks DATE **SAMPLE ID** 1-61502495 POR 200 1/24/97 0845 X X X UST 26-6 SOIL 1/24/97 0830 X UST 26 SOITKIP GLANK Time: 1/24/50 1240 Yellow = file

Attachment III

Certificate of Disposal (tank)
Disposal Manifest (hazardous waste)

ĺ

UST Certificate of Disposal

CONTRACTOR

Supervisor of Shipbuilding, Conversion and Repair, USN Portsmouth, VA
Environmental Detachment Charleston
1899 North Hobson Avenue
North Charleston 29405-2106

Telephone (803) 743-6482

TANK ID & LOCATION

NS26; Charleston Naval Base, Building NS 26, Thompson Ave., N. Charleston, SC

DISPOSAL LOCATION

Bldg. 1601 Tank Cleaning & Disposal Area Charleston Naval Complex

TYPE	OF	TA	NK
-------------	----	----	----

SIZE (GAL)

Waste oil

200 gal.

CLEANING/DISPOSAL METHOD

The tank was cut open on both ends, cleaned with a steam cleaner, cut into sections, and disposed of as recyclable scrap metal.

DISPOSAL CERTIFICATION

I certify that the above tank has been properly cleaned and disposed of as recyclable scrap metal.

O.S.Utheim

(Date)

APPENDIX B

GEOLOGIC BORING LOGS

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* When rock coring, enter rock brokeness, Drilling Area Background (ppm):["Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read. Remarks:

Converted to Well: Νo Well I.D. #:

	PROJECT NAME: PROJECT NUMBER:					<u>C.</u>	ve	BORING N	BORING NUMBER: 36 BI DATE:					
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			RIG:		_	5+4	- Ev	mel DRILLER:	_	R. Brust				
						М	ATE	RIAL DESCRIPTION			PIDIFI	D Res	ding (ppm)
	Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery ! Sample Length	Lithology Change (DeptivFt.) or Screened interval	18 18 18 18 18 18 18 18 18 18 18 18 18 1	e oler		S C S .	Remarks		Se Sempler ox		
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	= Inch	ide moi narks:	nitor readi	ng in 6 foc	t intervals	@ borehole	. Incr	ease reading frequency if elevated repo		Backgrouп	ing A d (pp			
	Con	vente	d to W	eii;	Yes	Jun	-	No Well I.	.U. #:					

		RIG:	PANY:	_ <	Colum	4त् ध	ohn	DRILLER:		R. Brown	<u> </u>		
Sampl No. end Type (RQD	(FL) or Run	Blows / 6" or RQD (%)	Sample Recovery / Semple Length	Lithology Change (Depth/Ft.) or Screened Interval	Sott Densityi: Consistenc y vot Rock: Hardness	COS	RIAL DESCRIF	sileston:	J % C % ·	Remarks	Service of the servic		BE BUILDING THE BU
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		NUM					DATE:	СТ.	7/26/91				
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Sample No. and Type or RQD	(FL) or	Blows / 5" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	Soli Denalty/ Consistenc y or Rock	Color	RIAL DESCRIPTION Material Classification	0 % C % •	Remarks	PIDAL	Sampler BZ X	Borehole**	Driller BZ** 3
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PRO. DRIL	JECT LING LING Depth (FL) or	NAME NUMI COMI RIG:		Lithology	Soil	IATE	DATE: GEOLOGIS		BER: 36 13 14 7/26/44 1-13.000 Remarks	PID/FI	Sampler BZ B	Borehole**	Driller 62** 36
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PROJECT NAME:				Cue.			BORING N	BORING NUMBER: 36 B/S DATE: 7/26/94			· ·				
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	1						IAL DESCRIPTION	ΤĪ		PROF	ID Ree		(married 1)		
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Cor	verte	d to W		Yes	Tiens	<u>د</u>	No Well I	.D. #:			_		_		

PROJECT NAME: CILE BORING NUMBER: 36/5/6													
		NUME			0.7		DATE:	010T	7/26/94				
		COMP	'ANY:		Coleen	<u> </u>	GEOLO: DRILLEI	_	V. Brand				
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Ren	narks.								Backgrout	id (bi): 	Щ	٧
Con	verte	W at b	eli;	Yes	Tun	<u>~</u>	No We	II I.D. #:					

3-4' 0 5-6' 38 19 19

BORING NO.: W. O.

PROJECT CNC	LOCATION: 5:4-36	DRILLER Kilbrond.
PROJECT NO.	BORING P Was &	METHOD: DPT
ELEVATION	DATE \$/3/99	DRILLING
FIELD GEOLOGIST		DEVELOPMENT: NA
		-
	ELEVATION OF TOP	OF SURFACE CASING:
	ELEVATION OF TOP	
	STICK -UP TOP OF SI	
	STICK-UP RISER PIPE	
	1.D. OF SURFACE CAS	
CROUND V	TYPE OF SURFACE S	SEAL: Concrete - Flugh
ELEVATION		
	RISER PIPE I.D.;	
	TYPE OF RISER PIPE	: 40-PUC
	BOREHOLE DIAMETE	:P-
	TYPE OF SEAL:	•
	ELEVATION / DEPTH	OF SEAL: 10.5
	TYPE OS SEAL: -	
	711 2 00 0DAL. [[
	DEPTH TOP OF SAME	D PACK: 1.0
	DEPTH TOP OF SANG	7:0
	ELEVATION / DEPTH	TOP OF SCREEN:
		/
	TYPE OF SCREEN:	40-1704
	SLOT SIZE VIENOTI	+: 0.01" K10'
	SLOT SIZE X LENGTR	
	I.D. OF SCREEN:	1.25"
		.4. 0
	TYPE OF SAND PACE	e Madium
	ELEVATION / DEPTH	BOTTOM OF SCREEN:
	ELEVATION / DEPTH	BOTTOM OF SAND PACK: 1/60/
		BOTTOM OF SAND PACK: BELOW OSSERVATION OF HOLE: 12.0
	WELL:	117 /
	ELEVATION / DEPTH	11C.C

		BORING LOG		age of	
PROJECT NAME:	CNE	BORING NU	: JMBER: 34866 47/9/99	- 36P4	· 3
PROJECT NUMBE DRILLING COMPA			T:		
RILLING RIG:	Stratopo		K- 13 and		
		RIAL DESCRIPTION		PIDFID Reads	ng (ppm
No. (PL) 6" or Read or RGD Type or Run (%) 3	Limology Change (Depth/Ft Lample or Screened brauval	A September 1	S Remarks		
		Arabelt w/horse	Puy		4
7	Res	Souly Clay	1		4
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Remarks:	in 6 foot intervals @ borehole, inc	rease reading frequency if elevated repor	Backgro	rilling Area und (ppm):[
Sonverted to Wel	II: Yes Imp	No Well I.I	D. 종:		_

Page 1 of 1

PROJECT	CWC :	LOCATIO	N: CWE, 3, +236	DRILLER X.1300	m
PROJECT NO.	0.00	BORING	ρφ3	METHOD: DPT	
ELEVATION		DATE	814144	DRILLING	
FIELD GEOLOGIST				DEVELOPMENT: NA	
		4	- ELEVATION OF TOP OF	SURFACE CASING:	
_	9 1		-ELEVATION OF TOP OF		
			- STICK -UP TOP OF SUR		<u> </u>
			-STICK-UP RISER PIPE:		
			-I.D. OF SURFACE CASIN	IG;	
			TYPE OF SURFACE CAS	SING:	-
GROUND Y	ا الحر		TYPE OF SURFACE SEA	L' Concrete Fle	-sh
ELEVATION					- }
			- RISER PIPE I.D.:	40 Puc	}
			TYPE OF RISER PIPE:		- -
			- BOREHOLE DIAMETER:		-
	, 2		TYPE OF SEAL:		-
		1			-
			ELEVATION / DEPTH OF	SEAL:	105
			TYPE OS SEAL: FiL	u Sand	
					-
		◀	DEPTH TOP OF SAND P	ACK:	1-0
			ELEVATION / DEPTH TO	OP OF SCREEN:	17.0
	2				
	1		-TYPE OF SCREEN:	HOPUC	_
			SLOT SIZE X LENGTH:	0.01" × 10'	Ì
				1.25"	-
			I.D. OF SCREEN:	1,65	-
				211 0.	
	The state of the s		TYPE OF SAND PACK	Medium	-
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	1.26	(-
	(commented		ELEVATION / DEPTHBO	TTOM OF SCREEN:	1/7.0
			- ELEVATION / DEPTH BO	• • • • • • • • • • • • • • • • • • • •	177.
			TYPE OF BACKFILL BEL	OW OBSERVATION	I
			WELL: ELEVATION / DEPTH OF	L HOLE:	- 117.
		•	SEEAVION A DELIGIO	HOLE.	

		NAMI NUMI		Sik	36, B	<u>mild</u>	12,N52	<u>طر</u> BORIN DATE:	G NUM	BER: CNC 36-1	4 W	<i>o</i> /		_
				Cush	n Aill	٠,	~ 2 2 20	GEOLO		Geneld Good	<u> </u>			_
- DRIL	LING	RIG:		BK	57 M		_		R:	Rod Fuller				_
Sample No. and Type or RQD	(Ft) or	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	Solida Carroly Consistence		RIAL ÖESC		⊃ # O Ø •	Remarks		S WAS CARDING WAS A WAY	ding (
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- inclu		nitor readi	er rock brong in 6 foo		@ borehole	. Incre	ease reading frequ	uency if elevated	reponse n	sad. Drill Backgroun	ing A			_ _
Con	verte	to W	ell: /	Yes		-	No	We	II I.D. #	c~c36-MU	0 م			

BORING NO.:	
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PROJECT SILE 36, Buil DING NSZ6 LOCATIO	N: CNC Chulosha Zono I	DRILLER CIA-	Owllan
		METHOD: DPT	
ELEVATION - DATE		DRILLING Hollow	Sten Angel
FIELD GEOLOGIST Gerald Goode		DEVELOPMENT: NA	-
	.		
	ELEVATION OF TOP OF SU		
	-ELEVATION OF TOP OF RE		<u></u>
	- STICK-UP TOP OF SURFA	CE CASING:	FLUSTI
	- STICK-UP RISER PIPE:	0	FLUSH
	-I.D. OF SURFACE CASING: TYPE OF SURFACE CASIN		_
	TIPE OF SURFACE CASING	G. Market	_
GROUND V	TYPE OF SURFACE SEAL:	Concrete Mix	_
	E		
ELEVATION			
	-RISER PIPE I.D.:	2-inc	
	TYPE OF RISER PIPE:	Scll. 40 Puc	<u>-</u>
]
	BOREHOLE DIAMETER:	Binches	_
	TYPE OF SEAL: PART		 -
	Concrete, e	12 M mick	1265 .
	ELEVATION / DEPTH OF SE	VERTE 10	1'1B(s
	TYPE OS SEAL: 30/65		1 / 50
	SILICA SUPO	312 WED	– (
	DICICA SAPE.		– i
	DEPTH TOP OF SAND PACE	K:	2' BCS
	ELEVATION / DEPTH TOP C	OF SCREEN:	3 / B/s
	TABLE OF GOODEN	a	
	-TYPE OF SCREEN:	SCH 40 PUC	-
	SLOT SIZE X LENGTH:	.010 × 10 PT	_
	I.D. OF SCREEN:	2-incl.	_
	TYPE OF SAND PACK:	20/30 STWARE	ا ہ
	SILICA SAND		<u> </u>
			_
	•		·
	ELEVATION / DEPTHBOTTO		13 / 6/3
	ELEVATION / DEPTH BOTTO		13.5'/ b/s =
	TYPE OF BACKFILL BELOW	OSSERVATION	
	WELL: ELEVATION / DEPTH OF HO	N E-	13.5/BIS
	ELEVATION / DEPTH OF HO	/LE.	13.2 1 815 -

		NAM		Sile 36 building NSIG					BORING NUMBER: (~) 36 - 14 0 7 DATE: 8/4/99							
					sdon f	0 .11		-	DATE; GEOLOGI	ST.	8/4	11/6.0			—	
		RIG:	ANI.				4/12:5		OBOLOG! DRILLER:	٠ı. ِ	0	1 K11-1		-		_
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Sample No. and Type or RQD	(FL) ar	Blows / & or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened interval	Soil Density Consistenc of Rock Hardness			Ç ja		> 0 ∩ 0 ·	R	emarks	A Sample Same			
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[™] Inclu Rem	^{ide mor} arks:		ng in 6 foo	t intervals	@ barehole	. Incre	No	frequen	cy if elevated repo		_	Drill Backgroun	d (p	pm)		
. CON	4 E11 E	1 TO AAG	·"· (Yes /		•	140		vveii i.	少. 帮	-CN	36.MW	0 2			

PROJECT SIL 36 NS 26	LOCATION: CNC Chiloston DRILLER CUS	4- Poillies
PROJECT NO.	BORING CNC26-MULAZ METHOD: DF	PT 1
ELEVATION	DATE 8/4/99 DRILLING Hold	L-sh- d-,01
FIELD GEOLOGIST 60011 Cook	DEVELOPMENT:	NA
·		
	_	
	ELEVATION OF TOP OF SURFACE CASING	
	ELEVATION OF TOP OF RISER PIPE:	
∭ .∤┌┐}◀	STICK -UP TOP OF SURFACE CASING:	Flool
· 	STICK-UP RISER PIPE: 1.D. OF SURFACE CASING: B-10. L Show	1 Flush
	TYPE OF SURFACE CASING:	populate (and
]]]]	THE OF BORFACE CASING.	
GROUND V	TYPE OF SURFACE SEAL: Coursely	ein Oilecae
		110 Can electrical
ELEVATION	·	
	RISER PIPE I.D.: 2. meh	
	TYPE OF RISER PIPE: SCH. YO PU	<u>e </u>
│	BOREHOLE DIAMETER:	/
	TYPE OF SEAL: Portle. TTYPE / Co	
	12 PT TMCK 14 H	<u>1'61</u> 5
	FI FI (A FIGURE OF CO.)	11865
	ELEVATION / DEPTH OF SEAL:	71005
	TYPE OS SEAL: 30/65 STANDARD	
	511110 Sm-0 (FINE SN-0	SEVE
	DEPTH TOP OF SAND PACK:	2' BCS
	ELEVATION / DEPTH TOP OF SCREEN:	3'186
	TYPE OF SCREEN: SON. YO	<u>'v </u>
	OF OT SIZE AT ENCIN	
	SLOT SIZE X LENGTH: . O/6 X/0	<u>**/</u>
	I.D. OF SCREEN:	
	i.b. of derection	
	·	
	TYPE OF SAND PACK: 20/30 STALD	18 P
	SICICA SAND	
	·	. [
	ELEVATION LIDERTUROTTON OF CORRES	13' 1815
100	ELEVATION / DEPTHBOTTOM OF SCREEN: ELEVATION / DEPTH BOTTOM OF SAND PA	
	TYPE OF BACKFILL BELOW OSSERVATION	12-5 10(5)
	WELL:	
	ELEVATION / DEPTH OF HOLE:	13.57 815

		JECT NAME:			<u> Sile 3</u>	36, Bil	11-	NS26	BORING N	UM	BER: CA	1C36-M	<u>woz</u>				
ı	PRO	JECT	NUM	BER:				DATE:	BORING NUMBER: (NC 36-MW03 DATE: B/4/99 GEOLOGIST: Good 6								
	DRIL	LING	COM	PANY:	<u> </u>	- P. S.	10 9	•	GEOLOGI	ST:	Gorald	60000					
)RIL	LING	RIG:		BEST	7 146	4 1	<u>e., </u>	DRILLER:		Rod	Teller					
Ī						N	IATE	RIAL DESC	CRIPTION				PIOFIO	Reading	(ppm)		
	Sample No. and Type or RQD	(FL) or	Blows i F or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval		Color	1.64	Classification	3 % O % •	Rer	narks			W. Griffet Der 1		
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		de mor	itor readi			@ borehole	. Incre	ease reading free	quency if elevated repor	18 0 F0		Drilli B ackgro un	ing Ar d (ppr		1		
	Conv	erted	to W	ell:	Yes)			No	Well I f), #	_	36-MW					
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BORING N	o :
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PROJECT S. Fe 34	Bailding NSZ6	LOCATIO	N: CNC Charleston	DRILLER	Pailling
PROJECT NO.		BORING	CN36-MW03	METHOD: DPT	ا ج
ELEVATION		DATE	8/4/99	DRILLING Amer	Lollon Sle
FIELD GEOLOGIST	Conid Goods		•	DEVELOPMENT: NA	
•					
				•	
	7	<u> </u>	TELEVATION OF TOP OF	SURFACE CASING:	
	1 ←		- ELEVATION OF TOP OF	RISER PIPE:	
			– STICK -UP TOP OF SURI	FACE CASING:	Flost
	11 		-STICK-UP RISER PIPE:		Flore
	」 │	-	- I.D. OF SURFACE CASIN		_
		İ	TYPE OF SURFACE CAS	ING:	_
\\				·	_
GROUND V				Li Concrehe Mix	- 1
ELEVATION			Quakerets	<u> </u>	-
		İ	DISCO DIDE LO .	2 "	
			RISER PIPE I.D.: TYPE OF RISER PIPE:	2-1014	-
			TYPE OF RISER PIPE:	SCH 40 PUC.	-
			BOREHOLE DIAMETER:	8 inches	-
			-TYPE OF SEAL: P. 4/		/
·			11 do F4 6		≥′
			77 00 1 7 8	-	_
			_ ELEVATION / DEPTH OF	SEAL:	1 1 B15
		_	TYPE OS SEAL: 30/6,		
			SILI LA SAND (FIND SAND SEAL)	-
					-
			DEPTH TOP OF SAND PA	ACK:	21 Bls
			_ ELEVATION / DEPTH TO	P OF SCREEN:	3º 1 Bls
			TYPE OF SCREEN:	SCH. YO PUZ	-
				0/0	4-
			SLOT SIZE X LENGTH:	.010 - mett & 10P	-/
			LO OF COREEN	4-11 An 2 P.	,
			I.D. OF SCREEN:	SCUM 2-IM	^
			TYPE OF SAND PACK:	20/30 STA-DARD	544.00
			SA~0	7. 571000000	- 5727774
			<u> </u>		-
	<,		-ELEVATION / DEPTHBOT	TOM OF SCREEN:	13'1815
	The second secon		ELEVATION / DEPTH BO	TTOM OF SAND PACK: /3	3.5'1B/5
			TYPE OF BACKFILL BELO	OW OBSERVATION	
			WELL: 20/30 57/	ANDARD SILICA SAM	ا ا
		-	ELEVATION / DEPTH OF	HOLE: /3	.51BC5

		NAM		S.4 30	6. Buils	ling	ععوند	BORING DATE: GEOLOG	NUM	BER: CAL	36.MI	<u>00</u>	<u> </u>		
וופח. ארי	JECT	NUM'	BEK; Bany:		ban D.			— GEOLOG	SIST.	8/4/7	7 /0				
DRII.	LING	RIG:	L ANT.	Br 5-	7 Mabi	LR		DRILLER	3101. }:	D.	Filher				
1		11,0.					RIAL DESC		" 	<u> </u>				dlag (==
Sample No. and Type or RCD	(FL)	Blows (F or RQD (%)	Sample Recovery i Sample Length	Lithology Change (Depth/FL) or Screened Interval	Soil Density/ Consistenc y or Rock Hardness			Classification	08081	Ren	arks	o was property and the		The Part November of Street	
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•• Incl		nitor readi	ler rock br ing in 6 for		@ borehok	e. Inch	ease reading free	uency if elevated re	ponse n		Dril Dril Jackgroun	ling A			<u></u>
Con	verte	d to W	ell:	Yes			No	Well	I.D. #		36-M	40 م	_	_	_

BORING	NO.:	

PROJECT Sile 36 Building NS26	LOCATIO	N: cac Charleston	DRILLER C.s.	Prilling
PROJECT NO.	BORING	CNC 36-4WOY	METHOD: DPT	
ELEVATION	DATE	8/4/99	DRILLING 14/1005L	u Augus
FIELD GEOLOGIST _ Gerald Good	_		DEVELOPMENT: NA	
			_	
		: -: -: -: -: -: -: -: -: -: -: -: -:	SUBSIDE DISING	
<u> </u>		ELEVATION OF TOP OF		
		- ELEVATION OF TOP OF : - STICK -UP TOP OF SURF		
		-STICK-UP RISER PIPE:	ACE CASING.	3'095
		-I.D. OF SURFACE CASIN	G: 2"	3 492
	ł	TYPE OF SURFACE CAS	ING: SCH. YO PU	<u> </u>
				_
GROUND V		TYPE OF SURFACE SEA	L:	<u> </u>
ELEVATION				
	_			
		-RISER PIPE I.D.:		
		TYPE OF RISER PIPE:	Sell 40 PUC	—
		BOREHOLE DIAMETER:	Binches	_
		TYPE OF SEAL: 90/44		
		Fire	- D	<u></u>
	ļ			
		ELEVATION / DEPTH OF		1'61
	 	TYPE OS SEAL: 30/65	STANDARD SIUCA	_ 1
		SULD (FINE SA	~0 SEA (_ !
		DERTH TOR OF CAND DA	016	21 011
		DEPTH TOP OF SAND PA	NCK:	2' BUS
		ELEVATION / DEPTH TOP	OF SCREEN:	3'1815
				-
	-	TYPE OF SCREEN:	SCH. YO PUC	_
	1	•	_	
		SLOT SIZE X LENGTH:	0.010 x 10FT	
		LD OF BOREEN	2 ,	
		I.D. OF SCREEN:	2-10-6-6	– i
	ľ		•	
NOTE: WELL LEFT		TYPE OF SAND PACK	20/30 STANDARD	
C.TH 3 PUC		SINCA SALD		
Stick-p since				
NEW CONCRETE				`
Suction being				
pouved. Grant				ŀ
send will be				
installed once a		ELEVATION / DEPTHBOT	TOM OF SCREEN	13.1 BCS
deformination,		ELEVATION / DEPTH BOT		13.5 /BCS
on Frank ground		TYPE OF BACKFILL BELO	· · · · · · · · · · · · · · · · · · ·	
suitre grado	,	_	DORD SILILA SAND	_
is made.		ELEVATION / DEPTH OF I		,5.5 TBIS
	_			

		NAME NUM!	E: BER:	<u> 32 ما 5</u>	, Buse Di	ے ند	N526	BORING N	UM	BER: CUC36-M	<u>w</u> 0	5		
DRILL	ING	COM	PANY:	BUST Mobile Ria BORING NUMBER: CNC36-MWOS DATE: B/1/99 GEOLOGIST: Grand Gooda BKS7 Mobile Ria DRILLER: Rod Faller							_			
ORILL	ING	RIG:		BKS	7 Mob.	le	R.	DRILLER:		Rod Feller				
- 			I				RIÁL DESCF	RIPTION			POFE	Ree	edina (DDM)
No. and	Depth (FE) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	Soil Density/		Material C		0 s c s ·	Remarks			Photo Table	Office Party
	1		3	•			Asplant	<u></u>						
	z		Ass.		مان مادر	200	Sond	in a gem	30	Dry				
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	-		25			524	Tclogry 5	: 14 Sand	3~	wet at 5'		ī	T	T
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	e mon		er rock bro ng in 6 foo		@ borehole	. Incre	ease reading freque	ency if elevated repo	nse fe	ed. Drilli Background				二
Conve	ertec	to We	ell:	Yes			No	Well I.I	D. #	: CNC 36 - MWO	5			

BORING NO	o .:

PROJECT Sile 34 Building NSZ4 PROJECT NO. ELEVATION		CNC 36- Now 05	DRILLER Code	Pilling Non Stone A
FIELD GEOLOGIST Goode	-DATE	<u>8/Y/99</u>	DEVELOPMENT: NA	
		ELEVATION OF TOP OF ELEVATION OF TOP OF STICK-UP TOP OF SURI	RISER PIPE:	ma ma 3'ags
│	1	-I.D. OF SURFACE CASIN	G: 2"	
		TYPE OF SURFACE CAS	ING: SCH. 40 PUC_	
CROUND C		TYPE OF SURFACE SEA	Ŀ	<u> </u>
FLEVATION		RISER PIPE I.D.: TYPE OF RISER PIPE:	2" Scu 40 Pre	_
	·	BOREHOLE DIAMETER: - TYPE OF SEAL:	g. well 81	<u> </u>
		ELEVATION / DEPTH OF TYPE OS SEAL: 30/6:1		
		DEPTH TOP OF SAND PA	ACK:	21 6/5
		_ELEVATION / DEPTH TOP	OF SCREEN:	3'165
		-TYPE OF SCREEN:	SCH YO PUC	_
		SLOT SIZE X LENGTH:	.010 ×10FT	_
		I.D. OF SCREEN:	عبد لا	_
NOTE: WELL				
PUL STICKUP		TYPE OF SAND PACK:	20/30 STENDERD	_
SINCO NEW		SILILA SAND		
BEING POWEED. BEING FOUEED. BROWT SEAL WILL BE INSTALLED				
ONCE A DETERMINE ON FIRM GROWD SURFACE GRADE 15 MODE.		-ELEVATION / DEPTHBOT ELEVATION / DEPTH BOT TYPE OF BACKFILL BELO	TTOM OF SAND PACK: DW OBSERVATION	13' 18cs
✓		WELL: <u>20/30 57/</u> ELEVATION / DEPTH OF I	HOLE:	13.51 bls

PROJECT CNC Chas, SC LOCA PROJECT NO. 0270 BORI	NGCNC36-MUNG METHOD: DFT 4,250
ELEVATION , DATE	
FIELD GEOLOGIST Mark Damington	DEVELOPMENT: NA
	<u> </u>
	ELEVATION OF TOP OF SURFACE CASING:
	ELEVATION OF TOP OF RISER PIPE:
— - - - - - - - - 	STICK-UP RISER PIPE:
 - -	I.D. OF SURFACE CASING: 8"(DX/OCOD
	TYPE OF SURFACE CASING: Flugh mount Steel cover w/ bolt on lid (PEMCO)
(Asphalt)	steel cover w/ bolt on Ital PEMCO)
GROUND	TYPE OF SURFACE SEAL: Con crope Food
ELEVATION	(Quickcrede) ZAXZAX. X6.14.
	RISER PIPE I.D.: PIC Schi-40 ET.
	TYPE OF RISER PIPE: PW 5ch.40
	Flugh Threaded (Fit.)
	BOREHOLE DIAMETER: 8.25 (a
	TYPE OF SEAL: Portland Cement
	Type I
	ELEVATION / DEPTH OF SEAL:
	TYPE OS SEAL: "Choke "Sand UF Qt.
	sand (30/65) (42 bas (50/6)
	TOTAL TOD OF CAMP CACK
	DEPTH TOP OF SAND PACK:
	ELEVATION / DEPTH TOP OF SCREEN:
IDW	CELIATION DEL TITLO OF GOLDEN.
(i) Drew of.	TYPE OF SCREEN: PUC, Sch. 40 F.T.
	· · ·
Soil Cuttings	SLOT SIZE X LENGTH: O.OIO IN X 10 FL.
	1.D. OF SCREEN: 216-
	THE OF SAMPRACK.
	(20/30) (7)5016. [642. Sand
	(20/30) (4/9010/104/45)
	,
	ELEVATION / DEPTHBOTTOM OF SCREEN:
	ELEVATION / DEPTH BOTTOM OF SAND PACK:
	TYPE OF BACKFILL BELOW OBSERVATION
	ω_{-}
	WELL: <u>Q4z · Sand (C29/30)</u> ELEVATION / DEPTH OF HOLE:



Page 🛕 of 🙎

RO. RO. RIL RIL	JECT JECT LING LING	NAME NUME COMF RIG:	E: BER: PANY:	Cus			BORING N DATE: GEOLOGIS DRILLER: RIAL DESCRIPTION	ST:	BER: B MI	PIDAFI	-		
ample No. and ype or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soli		· ·	U s c s ·	Remarks	eld Eas	Sampler BZ	Borehole**	Driller BZ**
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	ر اخ	/		15	<u> </u>		Greenish Gray Silty						
	16	0/		<i></i>			clas	_					
	17	1/	1	16.5					Setcoseins			 	
	18	1/1		18:0			Greenish Grup very		To 20.0				
	19	<u></u>			_		fine sand, Silty					**	
	৯০	_					Greenish gray silty clas. (organis)						
	 			-			clas. (organist)				<u> </u>	<u> </u>	
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		-	1		_			┼-		-	\vdash		
When	rock co	oring, ente	er rock bro	okeness.	_			<u>L_</u>					
' Inclu					@ borehole	. Incre	ase reading frequency if elevated repon	se rea	d. Drilli Background	_			<u>~</u>
		to We		Yes		_	No Well I.I		MWO2D	- (PF	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u> </u>	<u>ー</u>

,	D#	5 1	Sample	Lithology	N.	IATÉ	RIAL DESCRIPTION	T	-	PIDAF	D Rea	gnib	{pp
Sample No. and Type or RQD	(FL) or Run No.	Blows / 6" or RQD (%)	Recovery / Sample Length	Change (Depth/Ft.) or Screened Intervel	Soil Density/ Consistenc y or Rock Hardness	Color	Material Classification	U S C S ·	Remarks	Sample	Sampler BZ	Borshois**	Orliler BZ**
	aı	\angle					Dark Greenish Gry	y					
	ಷನ						silty clay						
	a 3	1/0	∕బ%										
	ay	1	,,		_			_		<u> </u>	Ш		L
	25	<u>/</u>	"	-	_								L
	<u> አ</u> ፍ	<u> </u>	, .	->			small, very fine						L
	<u>አ</u> ገ	Σ					sand lens. Triof Shell frags.			_	Ш		L
	28	Ž.				_	Shell trags.				Ш		L
	تج	The state of the s						<u> </u>		<u>} </u>			L
٠	<u>20</u>	<u>,</u> 0				_				_	Ш		L
	31	1/2		->			moreused sand	-			-		_
	32	3 4				·	Lens.	_	<u> </u>	_			L
	33	9/3	_					<u> </u>			Ц		Ļ.
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	<u>३६</u>	45		B.T.				-	Will set 55.0	+	<u> </u>		
			<u> </u>					<u> </u>	well screen w/.010 slet from 31.0-36.0	<u> </u>	_		<u> </u>
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	<u> </u>		er rock bro										<u> </u>

BORING NO.: MW-7D

PROJECT CNC36	Site 36	LOCATION:	MW-70	DRILLER ROD	
PROJECT NO.		BORING	MW-7D	METHOD: DPT.	. a/: '
ELEVATION	, , , , , , ,	DATE	8-10-99	DRILLING CUSTOM D	Cilling
FIELD GEOLOGIST TE	-14:11			DEVELOPMENT: NA	
Tech					
			LEVATION OF TOP OF S	NIREACE CASING	
<u> </u>			LEVATION OF TOP OF R	-	
	│ 廴		STICK -UP TOP OF SURF	-	
— .		,	STICK-UP RISER PIPE:	-	
	│	1.	D. OF SURFACE CASING	5: 7 "	
		י	YPE OF SURFACE CASI	NG: 8" Man hale Co	ver
GROUND V		<u> </u>	YPE OF SURFACE SEAL	Concrete	
ELEVATION) _			ď
		_	RISER PIPE I.D.:	~ "	
		1	YPE OF RISER PIPE:	Puc.	
		'	THE OF MIDERY II E.	PVC	
			OREHOLE DIAMETER:	10/4"	
,		— т	YPE OF SEAL PORT	Gement Typ	工一
		_	Groute		
		_	·	5 0	01
			LEVATION / DEPTH OF S		2 /
		·	THE US SEAL! DOTTE		1
		_			,
			EPTH TOP OF SANO PA	ск: <u>а</u> ́	١7.0
			· FVATION (DEDTY TOD	OE 50055N 71	.01
		=	LEVATION / DEPTH TOP	OF SCREEN.	.07
			VBE OF COREEN	P.V.C.	
		,	YPE OF SCREEN:	_	
		s	LOT SIZE X LENGTH:	.010 × 10'	
		1 .	D. OF SCREEN:	a′′	
	3 5		D. OF SCILLIA.		j
	4 . 5				
			YPE OF SAND PACK		
		-	20/30 silica	Sand,	
				,	. 1
		- (]
		İ			1
		— E	LEVATION / DEPTHBOT	TOM OF SCREEN: 36	0/
		,	LEVATION / DEPTH BOT	TOM OF SAND PACK:	/
· ·		I	YPE OF BACKFILL BELO	W OBSERVATION	1.
		!	VELL:	1015	,
		Ε	LEVATION / DEPTH OF H	- IULE:	1

Subject	Number HS-1.0	Page 10 of 11
UTILITY LOCATING AND EXCAVATION CLEARANCE	Revision 0	Effective Date 06/99

ATTACHMENT 2 UTILITY CLEARANCE FORM Completed by: K. Franklin Project No.: Site Location: 5: 1. 36 P61 Work Date: Excavation Method/Overhead Equipment: Circle One 1. **Underground Utilities** (ves) no N/A Review of existing maps? yes no N/A b) Interview local personnel? ves no N/A c) Site visit and inspection? Excavation areas marked in the field? ves no N/A b) es no N/A Utilities located in the field? e) Located utilities added to site maps? yes fo N/A f) State One-Call agency called? (ves) no N/A g) Caller. Your Callidan Ticket Number: Date: Geophysical survey performed? h) Survey performed by: Method: i) Hand auguing performed? Auguring completed by: Total depth: 4 feet) Trench/excavation probed? Probing completed by: Depth/frequency: 2. Present Absent Overhead Utilities Determination of nominal voltage yes no N/A a) Marked on site maps b) yes no N/A Necessary to lockout/insulate/re-route yes no N/A c) Document procedures used to lockout/insulate/re-route yes no N/A d) Minimum acceptable clearance (SOP Section 5.2): e)

Date

cc: PM/Project File Program File

Approval:

Site Manager/Field Operations Leader

6.

UTILITY LOCATING AND EXCAVATION CLEARANCE		Number HS-1.0	Pag	e 10 of 11	
		Revision	Effi	ective Date	
		0		06/99	
		ATTACHMENT			
	UTILIT	Y CLEARANCE			
Project No.: _		Completed by:	8/4/99		
Site Location	35ite 36, P42	Work Date:	8/4/99		
Excavation M	ethod/Overhead Equipment:	DPT.			
		•	Circle Or	ne	
1. Unde	rground Utilities			_	
a)	Review of existing maps?			N/A	
b)	Interview local personnel	?	ves no		
·c)	Site visit and inspection?		(yes) no	N/A	
b)	Excavation areas marked		√es no		
e)	Utilities located in the field	-		N/A	
Ŋ	Located utilities added to		yes 660		
g)	State One-Call agency ca		yes) no	N/A	
	Caller. <u> Paul Co</u>		_		
	Ticket Number:	Date:	2	`	
h)	Geophysical survey perfo	d2	yes no	AL/A	

ýes) no N/A

yes no MA

Present Absent

yes no N/A

NA

yes no

yes no

Method:

Overhead Utilities

i)

j)

a)

b)

C)

d)

Approval:

PM/Project File

Program File

2.

6.

CC:

Hand auguring performed?

Trench/excavation probed?

Probing completed by:_____
Depth/frequency:_____

Marked on site maps

Site Manager/Field Operations Leader

Determination of nominal voltage

Necessary to lockout/insulate/re-route

feet

Minimum acceptable clearance (SOP Section 5.2):

Date:

Document procedures used to lockout/insulate/re-route yes no N/A

Date:

Date

Auguring completed by:_
Total depth:

\(\mathcal{F} \)

APPENDIX C FIELD SAMPLING DATA SHEETS

					Page	of
Project Site Nar Project No.:	ne:	CNC		Sample ID Sample Lo Sampled E	No.: 3652 ocation: $5+36$ By: 1.7	Bd20405 Buelole#
Surface So				C.O.C. No	.:	
B Subsurfac	e Soil			Tunn of St	an min.	
Sediment Other:				Type of Sa	oncentration	
[] QA Sampl	le Type:				Concentration	
GRAB SAMPLE DAT	PA+	10 ¹ 100 ¹²		<u>-</u>	Star 1	
Date: 9/2/19		Depth	Color	Description	(Sand, Silt, Clay, Moi	sture, etc.)
Time: /600	_ \	,	Brownish	I	·	,
Method: ららて		1 4-5	10000011	Silty Clay, wet		
Monitor Reading (ppm		<u> </u>	(avery)			
COMPOSITE SAMPLE DATA:			<u></u>		Marie Marie III	-4: -4)
Date:	Time	Depth	Color	Description	(Sand, Silt, Clay, Moi	sture, etc.)
Method:						
Monitor Readings	 	<u> </u>				
(Range in ppm):		 	 			
(Kange in ppin).		 	· † - ·	1		
		 		<u> </u>		
		† – – – –	 	 	***	
SAMPLE COLLECT	ION INFORMA	ATION:		1		
	Analysis		Container Requ		Collected	Other
BTE	Χ		4 x 5 4 E 11	Cec		
PAH,	Wanky	thalene	402	0		
Metu	l,		402 (سو		
TPH			807	<u> </u>		
7 [-7-1			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
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 						-
OBSERVATIONS / I	NOTES:	9.91		MAP:	1 1	
Boneho Rock	let Z	- John				,
					1 1	
Circle if Applicable	*	1. A.M		Signature(s):	1 1111	
MS/MSD Duplicate ID No.:					Tall	

Sample ID No.: 3652843444 5 Sample Location: 5:7=36cnc Project Site Name: Project No.: Sampled By: □ Surface Soil C.O.C. No .: Subsurface Soil N Sediment Type of Sample: **B** Low Concentration [] Other: □ QA Sample Type: ∏ High Concentration GRAB SAMPLE DATA: Date: 9/2/199 Depth Color Description (Sand, Silt, Clay, Moisture, etc.) Time: 1430 4-5' Sandy Clay, Moist Method: 55 Trong Monitor Reading (ppm): 4 COMPOSITE SAMPLE DATA: Date: Color Description (Sand, Silt, Clay, Moisture, etc.) Depth Method: Monitor Readings (Range in ppm); SAMPLE COLLECTION INFORMATION: Analysis Container Requirements Collected BTEX 4 x54 Eucon PAH West the lame Meta/s 4026 8026 **OBSERVATIONS / NOTES:** MAP: Borehole #3 Sample contains rocks ¿ clumbs of asphalt Circle if Applicable: Signature(s): MS/MSD **Duplicate ID No.:**

Sample ID No.: Project Site Name: Project No.: Sample Location: R Sampled By: [] Surface Soil C.O.C. No.: P Subsurface Soil ☐ Sediment Type of Sample: Low Concentration
High Concentration [] Other. [] QA Sample Type: GRAB SAMPLE DATA: Date: 9/23/94 Description (Sand, Silt, Clay, Moisture, etc.) Depth Color Time: 0700 Course Sand, Moist Method: 53 Thomas Monitor Reading (ppm): 🛷 COMPOSITE SAMPLE DATA: Date: Time Depth Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm). SAMPLE COLLECTION INFORMATION: Collected Other Analysis Container Requirements 1876 X. Hanbalan 4 X 5 4 Eller PAH 4 02 6-Me fuls 1124 8 326 **OBSERVATIONS / NOTES:** MAP: Circle if Applicable: Signature(s): MS/MSD **Duplicate ID No.:**

Sample ID No.: 365/305040 S Sample Location: 5:te 36 CNC Project Site Name: Project No.: Sampled By: C.O.C. No.: [] Surface Soil fly Subsurface Soil Sediment
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 Sediment Type of Sample: [] Other: ★ Low Concentration [] QA Sample Type: | High Concentration GRAB SAMPLE DATA: 9/2/199 Description (Sand, Silt, Clay, Moisture, etc.) Date: Depth Color 1120 Time: Greyist Silty Clay, Moist 4.5' Method: 55 Trouvel Brown Monitor Reading (ppm): 25 COMPOSITE SAMPLE DATA: Date: Time Depth Color Description (Sand, Silt, Clay, Moisture, etc.) Method: Monitor Readings (Range in ppm): SAMPLE COLLECTION INFORMATION: Anaiysis Container Requirements Collected Other BTEV 4 x5 4 Encour 4026 Me tals 8026 ファム OBSERVATIONS / NOTES: MAP: Borhula# 5 Circle if Applicable: Signature(s): MS/MSD Duplicate ID No.:

					. ,	
Project Site Nati Project No.:	me:	CNC Site	36	Sample II	ocation: CNC3	6060304 65806
D 0	-11			Sampled	By: TNT	<u>TM</u>
Surface Subsurface				C.O.C. N	D.:	
Sediment []	a 2011			Type of S	ample:	
[] Other:					concentration	
[] QA Samp	le Type:				Concentration	
ORAD SAMPLE DAT	12.1	S. 10 Sec. 10		14 A.G.		
Dete: 9-24-9	4	Depth	Color	(Sand, SHt, Clay, Mo	isture, etc.)	
Time: 1649		_	4 Grey/	Light Gi	ey, Medium 8	ilty sand
Method: Monitor Reading (ppm):		3-4	Dk Grey	W/ som	e dk grey clay	
COMPOSITE SAMP		on pulsar and all the	DE CHO			
	T		T	Dog-day's	Mand Olf Olay Ma	
Dule:	Time	Depth	Color	Description	Sand, Sitt, Clay, Mo	sture, etc.)
Method:						``\``
Monitor Resdings	 		-	 		
(Range in ppm):						
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SAMPLE COLLECT	TON BECOME					_
SAMPLE COLLECT	Analysis	(Company	Container Ber	u úremente	Collected	Other
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TPH				8 02		
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OBSERVATIONS /	VOTES:	11.124		MAP:	1	
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0-1						
1-2	Ø			1		
2-3	69.7	44.3				
3- ५	457.8	78.8				
Circle if Applicable	6 (1) (1) (1)	2 %		Signature(s):		
MS/MSD	Duplicate			7	\mathcal{I}	
				VG		

Project Site Nar Project No.:	me:	CNC		Sample ID Sample Loc	No.: 3654 cation <u>50.444</u> y: <u>1.5.4</u>	BO79364 #4,5;+=3	
[] Surface So	oil .			C.O.C. No.	y : <u> </u>	LKI,~	
∬ Subsurface				C.O.C. 140.	•		
[] Sediment	e Suii			Type of Sa	mple:		
[] Other:					ncentration		
[] QA Sampl	le Туре:			High Concentration			
GRAB SAMPLE DAT	Γ A: -	1),14			÷. •		
Date: 9/23/90	1	Depth	Color	Description (Sand, Silt, Clay, Mo	sture, etc.)	
Time: 1210		_	Romei			1	
		3~4'	Brownic	Clayey Sand, Moist			
Monitor Reading (ppm		<u> </u>	151 4 610	<u></u>	<u> </u>		
COMPOSITE SAMPI	LE DATA:						
Date:	Time	Depth	Color	Description (Sand, Silt, Clay, Mo	sture, etc.)	
Method:							
Monitor Readings							
(Range in ppm):							
}							
					-		
							
SAMPLE COLLECT	ION INFORMA	TION:	•				
	Analysis		Container Req	uirements	Collected	Other	
BTEX 1	agh that	una	4x54 E11	cer			
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1741+			4066	-		<u> </u>	
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		-	4 066				
Metals			4026				
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Metals	VOTES:		4026				
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Metals TPT			4 02 6	MAP:			
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Metals TPT			4 02 6	MAP:			

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Nam	16:		c 36		Project No.:	CNC 3	b	
Location:			RUESTON		•	P8/10		
Weather Co					Measuring De	vice: KE	ECK Mil.	
Tidally Infl	uenced:	Yes	No		Remarks:			
Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Readin (feet)*	Thickness of Free Produc (feet)*	Groundwater Elevation (feet)*	Com
36NP#S	91099	1006		13.04	5.86			
36m054		_		12.95	5.94			
680002	41055	1008			5.24			
36m&3		1009		12.77	5.05			
36moz		1011		12.67	5.81 .		_	
3607D				35.92				
3602	91099	1016		12.90	5.67		ļ	
36680004		_		13.84	546			
	91099		_	11.55	5.75			
P03	9 10 95			11.81	5.62/569	PP.05		
36m06	91039	1033		12.92	3.51			
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GROUNDWATER LEVEL MEASUREMENT SHEET

<u> </u>			<u></u>	<u></u>		7		
Project Nam	ie:	Site	34		Project No.: Personnel: Measuring Dev	0270/	CT00103	<u> </u>
Location:		CNIC			Personnel:	Calliga	n Swan	sou
Weather Co	nditions:	<u> </u>	udy		Measuring Dev	ice: OKS	Interface i	Pobe
Tidally Influ	ienced:	Yes	<u> ✓</u> No		Remarks:			
		r 			- 		· 	r
Well or			Elevation of	Total	Water Level	Thickness of	Groundwater	
Plezometer	Date	Time	Reference Point	Well Depth	Indicator Reading	Free Product	Elevation	Commenta
Number			(feet)*	(feet)"	(fact)*	(feet)"	(feet)*	:
CNC36	12/2-/22	} 		 	 -		· 	ļ
MWI	10/20/99	1552		ļ	4.37			odor
POI	10/20/99	1554			4.61	Shoen	, <u></u>	odor
POZ	10/20/99	1556			4.50	4.36-4.51 0.14ft	• 	FP
CNC36	10/20/99	1550			4.67			odor
MW4	16 20/99	1601	, i		4.75	l		
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All measuremen	ts to the near	est 0.01 foo	t T					

GROUNDWATER SAMPLE LOG SHEET

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Page_

Project Site Name: Project No.: [] Domestic Well Data [] Monitoring Well Data [] Other Well Type: [] QA Sample Type:		<u> </u>			Sample C.O.C. Type of [] Low	Location: d By:	ation	-004 -008 -000
SAMPLING DATA:								
Date: 8-13-99	Color	pН	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1754	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: PURGE DATA:								<u> </u>
		T					<u> </u>	
Date: 8-13-99	Volume	рH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: Low Flow	Initial	6.83	3.41		54	1.80		
Monitor Reading (ppm):	1	6.73		24.0	0	19.99	 	-
Well Casing Diameter & Material	2	6.45		24.3	0	1.60		<u> </u>
Type: 2"PUC_	3	6.56	3.36	24.0	0_	1.74	 	
Total Well Depth (TD): 12.84							<u> </u>	
Static Water Level (WL): 5.41					<u> </u>		<u> </u>	
One Casing Volume@avL): 1.33								
Start Purge (hrs): 1720								
End Purge (hrs): 1754								
Total Purge Time (min):								
Total Voi. Purged (gal/L):								
SAMPLE COLLECTION INFORMA	TION:							
Analysis		Preservative		Container Requirements			Collected	
>				<u> </u>				
PAH					1×1 L			<u> </u>
BTEX		HCI			3 2 40 2			†
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OBSERVATIONS / NOTES:		L						
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Circle if Applicable: Signature(s):								
MS/MSD Duplicate ID No.:								

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Project Site Name:

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Sample ID No.:

Sample Location: CNC36 MWI Project No.: Sampled By: DA [] Domestic Well Data C.O.C. No.: Monitoring Well Data Type of Sample: [] Other Well Type: [] Low Concentration [] QA Sample Type: [] High Concentration SAMPLING DATA: Date: 8-13-99 DO Salinity Other Color рΗ S.C. Turbidity Temp. 1252 mg/l % Time: Visual Standard mS/cm Degrees C NTU NA Method: PURGE DATA: Date: 2-13-99 DO Salinity Volume ρН S.C. Temp. (C) Turbidity Other 6.76 0.93 7.73 42 Method: Care Flage Initial 27.7 0 24.9 6.72 5.06 Monitor Reading (ppm): 1.64 6.70 1.74 0 269 Well Casing Diameter & Material 2 24.9 Type: Z" PUC 3 6.74 24.9 0 フロい Total Well Depth (TD): 12.67 Static Water Level (WL): 5.80 One Casing Volume(@aVL): 1.10 Start Purge (hrs): 17,1921 End Purge (hrs): 1750 Total Purge Time (min): Total Vol. Purged (Gal/L): J. C SAMPLE COLLECTION INFORMATION: Analysis Collected Preservative Container Requirements PLL スレーレ 3 x 40 mL 401 BLEX EDB **OBSERVATIONS / NOTES:** 9 6. 67 6.87 Horiba reading effected by sooty Film stubers cameining from existing matt. Mailly Do & Torbidity

Cleaned Hariba as back as pos. after 200 U. lume Circle if Applicable: Signature(s): MS/MSD Duplicate ID No.:

Page____ of ____

Project Site Name: Project No.: [] Domestic Well Data ** Monitoring Well Data [] Other Well Type: [] QA Sample Type:		<u>. 36</u>			Sample C.O.C. Type of	ed By:	ation	263 6 004 0 6 8 0 004
SAMPLING DATA:								
Date: 9 10 99	Color	рH	s.c.	Temp.	Turbidity	DO	Salinity	Other
Time: W5	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: LOW FLOW	<u> </u>				<u> </u>			
PURGE DATA:							-	
Date: 9 16 99	Volume	рН	s.c.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: LOW FLOW	Init i al	7.19	3.60	24.6	3	0.37	N/A	
Monitor Reading (ppm): 0 - D	1	7.05	3.24	24.7	3	1.32	T_{I}	T
Well Casing Diameter & Material	2	6.59	3.18	24.8	4	0.58		
Type: a" PVC	3	6.64		24.8		D. 53	1 	
Total Well Depth (TD): 13.84		<u> </u>	<u> </u>				 	
Static Water Level (WL): 5.46		 	 	<u> </u>	 	+	+-\/-	+ -
One Casing Volume((AL): 1.3	 	 		 	<u>-</u>	+	 	
One Casing Volume(gav.L). 1 >	 		 	 	 	+	+	
Start Purge (hrs): 1049	 	 	 	 	 	+	 	
End Purge (hrs): 110	<u> </u>		 	 	 	+		 -
Total Purge Time (min):		<u>-</u>	 	 	<u> </u>	 	 	
Total Vol. Purged (39/L): 4.0	<u></u>							
SAMPLE COLLECTION INFORMA	TION:							
Analysis METALS		Preser		 		Requirements	3	Collected
(110)100		Tho	3	 	1 ~ -1	R.		+
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OBSERVATIONS / NOTES:								
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MS/MSD Duplicate ID No.:	i				100	4×0		

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Project Site Project No.:		8175	36			Sample ID No.: 36 Sample Location: Sampled By:			nolol mwol
Monito [] Other	stic Well Data oring Well Data Well Type: ample Type:					C.O.C. Type of The Low			
SAMPLING DA									
Date: 9 [0]	74	Color	pН	s.c.	Temp.	Turbidity	DO	Salinity	Other
Time: ///0	, , , , , , , , , , , , , , , , , ,	Visual	Standard		Degrees C	NTU	mg/l	96	NA NA
Method: しかい		CLEAN	6.61	1.75	25.6	12	046	NA	<u> </u>
PURGE DATA:			T		T		T	T	- -
	99	Volume	pH	s.c. •086	Temp. (C)	Turbidity	DO A U.C	Salinity	Other
Method: Lbh		Initial	<i>458</i>		25.8	<u> 5</u>	0.45	NA	
Monitor Reading		1	652	.943	25.9	5	0.38	NH	
Well Casing Dia	meter & Material	2	6.55	1.29		3	0.31	MA	
Type:	PYL	3	6.61	1.35	25.6	2	0.46	MA	
Total Well Depth	h (TD): 12.67								
Static Water Lev	vel (WL): 5.8								
One Casing Vol									
): HT 1045						 		† · · · · · · · · · · · · · · · · · · ·
End Purge (hrs)		-							
Total Purge Tim					 		<u> </u>		
Total Vol. Purge									
	ECTION INFORMA	TION:							
	Analysis		Preser	vative		Container R	Requirements		Collected
MET	als		HW	5 ₇		YI	Lite,		
									
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Page___ of ___

Project Site Name: Project No.:	<u>C</u>	NC30	0	-	Sample Sample Sample	Location:	36 GLM OZOI CNC36 MWOZ		
[] Domestic Well Data P Monitoring Well Data [] Other Well Type: [] QA Sample Type:					C.O.C. Type of	•	ition		
SAMPLING DATA:									
Date: 9 🕒 9	Color	pН	S.C.	Temp.	Turbidity	DO	Salinity	Other	
Time: 713 1058	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA.	
Method: Low Flow									
PURGE DATA:		7-85	1.41	25,9	44	0.80			
Date: 0 \ 16 9	Volume	pН	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other	
Method: Low FLOW	Initial	7.35	71-39	25.9	10	1.30			
Monitor Reading (ppm):	1	7.16	511	25.03	15	1.41		1.16	
Well Casing Diameter & Material	2	7.03	2.04	25.3	Ø	1.02		232	
Туре: <i>Э" Р</i> УС	3	7.10	2.01	25.3	,	1:70		3.48	
Total Well Depth (TD): 12,93	4	7.05		25.3	Ø Ø	1.54		4.64	
Static Water Level (WL): 5.71	7	1	2.13	23.7	<u> </u>	1:21		1.0	
							 	 	
One Casing Volume(gal/L): 16				1					
Start Purge (hrs): 0955								 	
End Purge (hrs): /045								-	
Total Purge Time (min): 40							<u> </u>	 	
Total Vol. Purged (gal/L):				<u> </u>					
SAMPLE COLLECTION INFORMA	ATION:	1 _		7				12	
Analysis		Preser				Requirements	.	Collected	
8260		16C		<u> </u>	7,40 m			 	
METALS		1 6		ا حا	VILTO			3	
ANIONS		Unt	77	1	V 500			+ + +	
DIS META.		HCI		1 2	3× 40 r			3	
Ut 3 (MDT)		1 100) × 101	•		 _s	
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OBSERVATIONS / NOTES:				•					
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34GLN	10201	N		`	トレレ		1 (-		

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Moniton [] Other V	tic Well Data ring Well Data			6 b		Sample C.O.C. I Type of Low	Location: d By:	etion	16301 36mwo3	
SAMPLING DAT	TA:							-		
Date: 913	99	Color	рΗ	S.C.	Temp.	Turbidity	DO	Salinity	Other	
Time: 115	5 1131	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	96	NA.	
Method: DW		V ISCAL	Standard	шалсы	Degrees C	NJO	mig/i	-	110	
PURGE DATA:	, –									
	99	Volume	рН	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other	
Method:	11	Initial	7.06	4.29			1.32			
	d 1.		7.03			/3				
Monitor Reading		1		3.18	25.9	3 2	141		<u>laı</u>	
Well Casing Dia		2	6.96e	3.11	25.9		1.22		2.42	
	PVC	3	6.94	3.28	25.9	-3	1.66		3,63	
	(TD): /2.80		ļ	ļ	-	••				
Static Water Lev	el (WL): <u>5.</u> 23		<u> </u>							
One Casing Volu	ıme(gal/L): 1,21									
Start Purge (hrs)	: 0952									
End Purge (hrs):	1039									
Total Purge Time	e (min): 47									
Total Vol. Purge										
	ECTION INFORMA	TION:						•		
	Analysis		Preser	vative		Container R	equirements		Collected	
826	\sim		l l	ساير		3440	mC		.3	
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OBSERVATION	S / NOTES:				<u> </u>					
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Page 1 of

CNC 36 Sample ID No.: 36GLm0401
Sample Location: CNC36 MW04 Project Site Name: Project No.: Sampled By: C.O.C. No.: [] Domestic Well Data ₩ Monitoring Well Data Type of Sample: Low Concentration [] Other Well Type: [] High Concentration [] QA Sample Type: SAMPLING DATA: Date: 9/ Lb 44 DO S.C. Temp. Turbidity Salinity Color рΗ Other Standard Time: 1510 Visual mS/cm Degrees C NTU mg/l NA CLEAN 2.79 29 0.81 Method: Low -600 25.7 PURGE DATA: Date: 9 Lo 99 Temp. (C) DO Volume S.C. Turbidity Salinity Other рΗ 738 0.71 Method: OW FLOW 26.0 Initial 0.74 26.4 Monitor Reading (ppm): $\mathcal{O} \cdot \mathcal{O}$ 0.76 2 154 Well Casing Diameter & Material Type: 2" WL 3 0.58 Total Well Depth (TD): 12.95 25.8 0.56 32 Static Water Level (WL): 5.74 One Casing Volum@I/L):1-1ン Start Purge (hrs): 1435 End Purge (hrs): 1509 Total Purge Time (min): 39 Total Vol. Purgeo (CalL): 5.6 SAMPLE COLLECTION INFORMATION: Analysis Container Requirements Collected Preservative 3×40 ML 6260 WCI PAH METALS Em くりひた **OBSERVATIONS / NOTES:** Circle if Applicable: MS/MSD Duplicate ID No.:

Page of /

Project Site Name: Project No.: [] Domestic Well Data Monitoring Well Data [] Other Well Type: [] QA Sample Type:		IC 36	2		Sample ID No.: Sample Location: Sampled By: C.O.C. No.: Type of Sample: [Low Concentrate] High Concentrate			
SAMPLING DATA:								
Date: 9 16 99	Color	рН	s.c.	Temp.	Turbidity	DO	Salinity	Other
Time: 1515	Visual	Standard	mS/cm	Degrees C	\	mg/l	%	NA
Method: Low Elow	CLEAT	619	1.62	26	9	0.81	NA	
PURGE DATA:			- <i>v</i>					_
Date: 9 \ 99	Volume	pН	s.c.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: LOW FLOW	Initial	7.02	.586	27.1	158	0.72	NA	
Monitor Reading (ppm):	1	6.81	.571	27.3	90	0.35	MH	
Well Casing Diameter & Material	2	685	.13	26.4.	85	0.27	N/A	
Type: 2" PVL	3	6.82	1.31	26.4	34	0.47	NA	
Total Well Depth (TD): 13.00	. •	6.88	1,60	26.2	·10	0.95	ALM	
Static Water Level (WL): 5.86		6.78	1.62	26-1	3	0.81	NA	
		611	1.00	2001	0	0.01	1,441	<u> </u>
One Casing Volume(gal/L): /-/	'	<u> </u>						 -
Start Purge (hrs): 1430		 		<u> </u>		_		 -
End Purge (hrs): 1 SOY								
Total Purge Time (min): 34								
Total Vol. Purged (ga)L):				l				,
SAMPLE COLLECTION INFORI	MATION:			-				
Analysis		Preser				Requirements		Collected
0,760		ILC.	<u>ال</u>			Omc		
PAH		1 2			271	LTR		
WELUTZ		HPM	<u> 53</u>	1	141	Letr		
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OBSERVATIONS / NOTES:								
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MS/MSD Duplicate ID N	o.:				1			

Page___ of ___

Project Site Name: Project No.: [] Domestic Well Data Monitoring Well Data [] Other Well Type:	SITE 36 CNC				Sample Location: Sampled By: C.O.C. No.: Type of Sample: LY Low Concentra		ation	
[] QA Sample Type:	-				. [] Higi	n Concentra	ation	
SAMPLING DATA:								
Date: 9 3 99	Color	pН	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: 1015	Visual	Standard	mS/cm	Degrees C	NTU	mg/l	%	NA
Method: Low Flow	Clear	7.04	3.32	27.6	Ø	1.68		·
PURGE DATA:						_		
Date: 9 1 99	Volume	pH	S.C.	Temp. (C)	Turbidity	DO	Salinity	Other
Method: LOW FLOW	Initial	6.81	11.0	25.B	5'	1.93		
Monitor Reading (ppm):	1	6.94	3.36	28:0	Ø	2.07		1.51
Well Casing Diameter & Material	2	6.96	3,27	28.0	0	1.98		3.05
Type: 2" PVC	3	704	3.32	27.6	Ø	1.68		4.53
Total Well Depth (TD): 3, 53								
Static Water Level (WL): 3,57				1				
One Casing Volume(gal/L): /-S/								
Start Purge (hrs): 093Z								
End Purge (hrs): /0/0								_
Total Purge Time (min):								
Total Vol. Purged (gal/L):								
SAMPLE COLLECTION INFORMA	TION:							-
Analysis		Preser				equirements		Collected
8260		HCC	_	40	mcx3			3
PAH		0				<u>r</u>	$\overline{}$	<u> </u>
METALS		HNO)द	}	Y LTR		<u> </u>	/
ANIONS	=	<u>6</u>		1	V 500			\ 1
M3. WELTHUN	<u>೮</u>	44	<u> </u>		<u>3 4 4 0 11</u>	<u>n</u>		\3
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OBSERVATIONS / NOTES:		1						
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Circle if Applicable:					Signature(s):			
MS/MSD Duplicate ID No.:					1 1/		1)

Page \ of | CUC 36 366cm 0701 Project Site Name: Sample ID No.: Sample Location: CNC36mwo7J Project No.: Sampled By: [] Domestic Well Data C.O.C. No.: Monitoring Well Data Type of Sample: Low Concentration [] Other Well Type: [] High Concentration [] QA Sample Type: SAMPLING DATA: Date: 9 16 99 Color рΗ S.C. Temp. Turbidity DO Salinity Other 120 NTU mg/l Time: Visual Standard mS/cm Degrees C NA 2900 ("UE)AV 10.0 Method: / DIW FIDA PURGE DATA: Date: 9 16 99 DO Volume S.C. Temp. (C) Turbidity Other 6.94 28.0 23.4 Method: LOW FLOW Initial 28.0 23.9 12.D 0.56 Monitor Reading (ppm): 0 . 0 . 1 28.3 Well Casing Diameter & Material 0.29 24.0 2 24,6 Total Well Depth (TD): 35.92 Static Water Level (WL): 7.62 One Casing Volume(DyL): 1.66 Start Purge (hrs): 1050 End Purge (hrs): [119 Total Purge Time (min): 29 Total Vol. Purged 18 VL): 5.46. SAMPLE COLLECTION INFORMATION: Analysis Preservative Container Requirements Collected 9260 3 x 40mu 1200 2 Y& LtR POH METALS IXILTR HNOS OBSERVATIONS / NOTES: PURGING STATURATED SCREEN . 101 SCREEN. Circle if Applicable: MS/MSD Duplicate ID No.:



CHEMetrics:

Standard Additions:

Notes:

_mg/L

Titrant Molarity:

FIELD ANALYTICAL LOG SHEET **GEOCHEMICAL PARAMETERS** Page \perp of 3Tetra Tech NUS, Inc. CNC 310 Sample ID No .: 3 6 GLM 0301 Project Site Name: Sample Location: Project No.: TTH MIT Sampled By: Duplicate: Field Analyst: Blank: Field Form Checked as per QA/QC Checklist (initials): SAMPLING DATA: 9/13/44 Date: Color ORP (Eh) S.C. Temp. Turbidity DO Sal. pН 113-103-055 CC) Time: (Visual) (+/- mv) (mS/cm) (NTU) (%) (SU) (Meter, mg/l) Lt. Rrown 3.28 *25.* ٩ 6.94 1 - W FLOW Method: 1.64 SAMPLE COLLECTION/ANALYSIS INFORMATION: Dissolved Oxygen: CHEMetrics (Range: 0 -) mo/L) Analysis Time: HACH Digital Titrator OX-DT Equipment: Range Used: Range Sample Vol. Cartridge Multiplier Titration Count Multiplier Concentration x 0.01 mg/L 1-5 mg/L 200 ml 0.200 N 0.01 2-10 mg/L 100 ml 0.200 N x 0.02 0.02 mg/L CHEMetrics: 0,3 mg/L Notes: Alkalinity: 11:00 Analysis Time: Equipment: HACH Digital Titrator AL-DT) CHEMetrics (Range: ____ Filtered: Concentration Range Used: Sample Vol. Cartridge Multiplier **Titration Count** Multiplier Range 10-40 mg/L 100 ml 0.1600 N 0.1 x 0.1 8 mg/L 40-160 mg/L 25 ml 8 x 0.4 = 0.1600 N 0.4 mg/L 100-400 mg/L 100 ml 1.600 N 1.0 x 1.0 E mg/L O 70Z = **LO4** 200-800 mg/L 50 ml 1.600 N 2.0 x 2.0 mg/L 500-2000 mg/L 20 ml 1.600 N 5.0 8 x 5.0 mg/L 1000-4000 mg/L 10 ml 1.600 N 10.0 x 10.0 ma/L Parameter. Hydroxide Carbonate Bicarbonate Relationship: 60 Y CHEMetrics: mg/L Notes: Standard Additions: Titrant Molarity: Digits Required: 1st.: 2nd .: 3rd.: Carbon Dioxide: 11:21 Equipment: HACH Digital Titrator CA-DT Analysis Time: CHEMetrics (Range: ____mg/L) Range Used: Range Sample Vol. Cartridge Multiplier Titration Count Concentration 10-50 mg/L 200 ml 0.3636 N x 0,1 0.1 mg/L 20-100 mg/L 100 ml 0.3636 N 0.2 x 0.2 mg/L 100-400 mg/L 200 ml 3.636 N 1.0 x 1.0 mg/L = 35 6 mg/L x 2.0 200-1000 mg/L 100 ml 3.636 N 2.0

Digits Required: 1st.:

2nd.:

3rd.:



FIELD ANALYTICAL LOG SHEET

GEOCHEMICAL PARAMETERS Tetra Tech NUS, Inc.

Page 2 of 3Sample ID No.: 3 & GLM 0301
Sample Location: CNC 36 NW03 C.NC 36 Project Site Name: Project No.: Sampled By: Duplicate: Field Analyst: Blank: Field Form Checked as per QA/QC Checklist (initials): SAMPLE COLLECTION/ANALYSIS INFORMATION: Sulfide (S²): Analysis Time: 12118 Equipment: DR-700 **HS-C Color Chart HS-WR Color Wheel** Program/Module: 610nm Other: 0,05 Concentration: Filtered: Notes: Տա(fate (Տ0₄²⁻)։ DR-700 Equipment: DR-8 _ _ Other: Analysis Time: 91 Program/Module: Filtered: Concentration: mg/L Standard Solution: Results: Standard Additions: Digits Required: 0.1 ml: 0.2ml; 0.3ml:_____ Notes: Nitrite (NO2-N): 15;30 Analysis Time: DR-700 Equipment: Other: Filtered: Program/Module: 0.313 Reagent Blank Correction: Concentration: mg/L Standard Solution: Resufts: Notes: Nitrate (NO₃-N): Analysis Time: **DR-700** Filtered: Equipment: DR-8__ Program/Module: 55 Concentration: mg/L Nitrite Interference Treatment: Reagent Blank Correction: L Standard Solution: Results Standard Additions: Digits Required: 0. hal: 0.2ml: 0.3ml: Notes:



GEOCHEMICAL PARAMETERS	7 7
Tetra Tech NUS, Inc.	Page <u> </u>
Project Site Name: CUC 36 Project No.: Sample ID N Project No.: Sample Loc Sample Loc Sample Loc Sample Loc Sample Loc Sample Loc Duplicate: Field Analyst: JTM & JA Field Form Checked as per QA/QC Checklist (initials): SAMPLE COLLECTION/ANALYSIS INFORMATION: Manganese (Mn ^{2*}): Equipment: DR-700 Program/Module: 525nm All	Analysis Time:
Concentration:mg/L	Filtered:
i _	Digestion:
Standard Solution: Results: Reagen	t Blank Correction;
Standard Additions: Digits Required: 0.1ml:0.2ml:0.3ml:	
Notes:	
Ferrous Iron (Fe ²⁺): Equipment: DR-700 DR-85 IR-18C Color Wheel Other: Program/Module: 500nm 33	Analysis Time:11 ¦ S Y
Concentration: Ox 0 3 mg/L	Filtered:
Notes:	
Hydrogen Sulfide (H ₂ S): Equipment: HS-C Other:	Analysis Time: 11:45
Concentration: 5.0 mg/L Exceeded 5.0 mg/L range on color chart:	
Notes:	
QA/QC Checklist: /	
All data fields have been completed as necessary:	
Correct measurement units are cited in the SAMPLING DATA block:	
Mulitplication is correct for each <i>Multiplier</i> table:	
I	
Final calulated concentration is within the appropriate Range Used block:	гА
Alkalinity Relationship is determined appropriatly as per manufacturer instructions:	
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project plant	ning documents:
Nitrite Interference treatment used for Nitrate test if Nitrite was detected:	
Title block is initialized by person who performed the QA/QC Ckecklist:	



Tetra Tech NUS, Inc.

Page 1 of 3

Project Site	Name: کرر	36				Sample ID N	o.: 76 0	76 MW0	1
Project No.:						Sample Loca	tion: CWC	36 MW0.	7
Sampled By:	TTM	7T 6				Duplicate:		_	
Field Analyst		JW 9.	TΔ	•		Blank;	Ħ		
	hecked as per (ials).	Um]	_		
	Consideration and the con-		_			I Toggings (Stephen)	n et selver et d'againmani par d'	nga, para dia kaong	
	13-94	Color	ORP (Eh)	s.c.	Temp.	Turbidity	DO	Sal.	pH
	10.55		` '		(°C)				1 -
Time:	m klom	(Visual)	(+/- mv)	(mS/cm) 2.13	25.3	(NTU)	(Meter, mg/l)	(%)	(SU) 7.05
	CTION/ANALYSIS I				23.3	L	L		
Dissolved Ox			•	e (o e como to estra estado de la	ANTICO (NECESTRALISMENT)		and substitution from 1994		非常的联络
Equipment:	HACH Digital Titrati	or OX-DT	CHEMetric	s (Range: C	> + 1 mg/L)) 	Analysis Time:	11:33	_
Range Used:	Range	Sample Vol.	Cartridge	Multiplier		Titration Count	Multiplier	Concentration	
	1-5 mg/L	200 ml	0.200 N	0.01			x 0.01	= mg/L	
	2-10 mg/L	100 ml	0.200 N	0.02			≭ 0.02	= mg/L	
CHEMetrics:	<u>. 2</u> mg/L								_
Notes:									
Alkalinity: Equipment:	HACH Digital Titrat	or AL-DT	CHE Me tric	s (Range: _	mg/L))	Analysis Time: Filtered:	□ :13	_
Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titra	tion Count	Multiplier	Concentration]
<u> </u>	10-40 mg/L	100 ml	0.1600 N	0.1		&	x 0.1	= mg/L	_
<u> </u>	40-160 mg/L	25 ml	0.1600 N	0.4			x 0.4	= mg/L	_
<u> </u>	100-400 mg/L	100 ml	1.600 N	1.0		88	x 1.0	= mg/L	4
	200-800 mg/L	50 ml	1.600 N	2.0	-	8 212	x 2.0	= 424 mg/L	_
	500-2000 mg/L	20 mi	1.600 N	5.0	<u> </u>		x 5.0	= mg/L	4
	1000-4000 mg/L	10 ml	1.600 N	10.0		88	x 10,0	= mg/L	_
ļ	Parameter.	Hvdroxide	Cart	onate	<u>ناه</u>	carbonate	7		
	Relationship:	O				24	-		
CHEMetrics:	mg/L		1	_	1	~ 1			
Notes:									
Standard Addition	ıs: Titrai	nt Molarity:		Digits Req	uired: 1st.:	2nd.:	3rd.:		_
Carbon Diox Equipment:	ide: HACH Digital Titral	or CA-DT	CHEMetric	≈ (Range; _	mg/L)	Analysis Time:	11/25	_
Range Used:	Range	Sample Vol.	Cartridge	Multiplier]	Titration Count		Concentration	
	10-50 mg/L	200 ml	0.3636 N	•	1		x 0.1	≖ mg/L	7
	20-100 mg/L	100 ml	0,3636 N		1		x 0.2	= mg/L	7
	100-400 mg/L	200 ml	3.636 N	1.0	1		x 1.0	= mg/L	7
\Box	200-1000 mg/L	100 ml	3,636 N	2.0	1	10/0	x 2.0	= 212 mg/L	7
CHEMetrics:	mg/L				_			· 	_
Notes:									_
Standard Addition	ns: L Titra	nt Molarity:		Digits Red	uired: 1st.:_	2nd.:	3rd.:	<u> </u>	



Tetra Tech NUS, Inc.

Page $\frac{2}{2}$ of $\frac{3}{2}$

		1				-1	10 AO - 3
Project Site	Name:	حسد عل	<u> </u>		Sample ID No.:	300	-MOZO)
Project No.:					Sample Location:	Cns	30 WM 05_
Sampled By:		TT & MT	<u> </u>		Duplicate:		
Field Analys	t:	T & MTT	<u> </u>	<u> </u>	Blank:		
	Checked as per			V/~v			
	CTIONANALYSIS	INFORMATION					
Sulfide (S ²):							1217
Equipment:	DR-700	DR-850	HS-C Color Chart	HS-WR Cold	or Wheel Anal	lysis Time:	12(1)
Program/Module:	610nm	93		Other:			
Concentration:	0,24	mg/L			F	Filtered: (
Notes:							
.							
Sulfate (S0 ₄ ²		_	_				
Equipment:	DR-700	DR-8	Other:		- Ana	ilysis Time: .	
Program/Module:		91					
Concentration:		mg/L			F	Filtered:	
Standard Solution		Results:		0.0			
Standard Addition	s: ப	Digits Require	ed: 0.1ml:	0.2ml:	0.3ml:		
Notes:							
Nitrite (NO ₂ *-	M)·				•	alysis Time:	12:35
_	DR-700	DR-850	Other:			irysis i ime: Filtered:	
Equipment:					- '	i inered:	_
Program/Module: Concentration:	1.065	60 mg/l			D ************************************	Camacat	
Coricentration:		mg/L			Reagent Blank	Correction:	H
Notes:					Standard Solution:	results:	_
Notes:				 -			
Nitrate (NO ₃	-N):				A	alysis Time:	
Equipment:	•	DB-¤	Other:			arysis i ime: Filtered:	
	DR-700	DR-8 55	———		-	. mereu,	_
Program/Module:		55 mg/l					
Concentration:		_mg/L			<u> </u>) Teach	П
Ctondard &	. <u> </u>	1			Nitrite Interference		
Standard Solution		Results:		0.01-	Reagent Blank	x Correction:	. پ
Standard Addition	าช; 🗀	∪igπs Requir	ed: 0.1ml;	U.2MI:	:IME,		
Notes:							



Page $\underline{\mathcal{J}}$ of $\underline{\mathcal{J}}$ Tetra Tech NUS, Inc. Sample ID No.: 76 GLM 0701 cnc 3r Project Site Name: Sample Location: CNC 74 MW =7 Project No.: Duplicate: Sampled By: Field Analyst: Blank: Field Form Checked as per QA/QC Checklist (initials): SAMPLE COLLECTION/ANALYSIS INFORMATION: Manganese (Mn²⁺): DR-700 HACH MN-5 Equipment: Other Program/Module: 525nm Concentration: mg/L Filtered: Digestion: Standard Solution: Results: Reagent Blank Correction: Standard Additions: Digits Required: 0.1ml:____ 0.2ml; 0.3ml: Notes: Ferrous Iron (Fe²⁺): DR-700 IR-18C Color Wheel Other: Equipment: Program/Module: 500nm 0.6 Concentration: mg/L Notes: Hydrogen Sulfide (H2S): Analysis Time: 11,42 Equipment: Other: 5.0 Concentration: mg/L Exceeded 5.0 mg/L range on color chart: Notes: QA/QC Checklist: Ail data fields have been completed as necessary: Correct measurement units are cited in the SAMPLING DATA block; Mulitplication is correct for each Multiplier table: Final calulated concentration is within the appropriate Range Used block: Alkalinity Relationship is determined appropriatly as per manufacturer instructions: QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: Nitrite Interference treatment used for Nitrate test if Nitrite was detected: Title block is initialized by person who performed the QA/QC Ckecklist:



Tetra Tech NUS, Inc.

Page 1 of 3

Project Site N	Name: Cメ	c 36				Sample ID No	o.: 366	LM 0 6 01	
Project No.:						Sample Local	tion: CNC	TOWN UE	<u>ا</u> و
Sampled By:	ベント	1 + T-				Duplicate:			
Field Analyst			TA			Blank:	Ħ		
	hecked as per (ials).	NM				
			and in income risks assessed						
9 10 10 30	13/44	Color	ORP (Eh)	s.c.	Temp.	Turbidity	DO	Sal.	pН
	15	(Visual)	(+/- mv)	(mS/cm)	(°C)	(NTU)	(Meter, mg/l)	(%)	
Title.	m Elon	Clear	(+/- 1111)	J.32	27.6	(NIC)	1.78	(*)	(SU)
	TION/ANALYSIS I		¥:	<i></i>					
Dissolved Ox			elendenia elikate seko od kako doko keo		erana necessario de aprocesa inspeciona estimate de la companie de	10: 10 - 10 - 200 anthonic district manner recited viscent 100	Perett, and the termination of the ferror and transfer		STANDARD STANDARD
	HACH Digital Titrato	or OX-DT	CHEMetrics	(Range: <u>©</u>	2-1 mg/L)	>	Analysis Time:	14:30	-
Range Used:	Range	Sample Vol.	Cartridge	Multiplier		Titration Count	Multiplier	Concentration	1
	1-5 mg/L	200 ml	0.200 N	0.01			x 0.01	= mg/L	
	2-10 mg/L	100 ml	0.200 N	0.02			x 0.02	= mg/L	
CHEMetrics: _ O	. 식_ _{mg/L}								_
Notes:									
Alkalinity:		<u></u>					Analysis Time:	14:19	_
Equipment:	HACH Digital Titrato	or AL-DT	CHEMetrics	s (Range: _	mg/L)	•	Filtered:		
Range Used:	Range	Sample Vol.	Cartridge	Multiplier	Titra	tion Count	Multiplier	Concentration	
	10-40 mg/L	100 ml	0.1600 N	0.1		&	x 0.1	= mg/L	4
	40-160 mg/L	25 ml	0,1600 N	0.4			x 0.4	= mg/L	4
	100-400 mg/L	100 ml	1,600 N	1.0		<u> </u>	x 1.0	= mg/L	4
<u> </u>	200-800 mg/L	50 ml	1.600 N	2.0	ь	8 190	x 2.0	= 38° mg/L	
	500-2000 mg/L	20 ml	1,600 N	5.0		&	x 5.0	≖ mg/L	_
	1000-4000 mg/L	10 ml	1.600 N	10.0		&	x 10.0	= mg/L	
Ī		ı			1		1		
•	Parameter:	Hydroxide	Carb	onate		arbonate	-		
	Relationship:	0		'	<u> </u>	, & Q]		
CHEMetrics: Notes:	mg/L								
Standard Additions	s: Titrar	nt Molarity:		Digits Reg	uired: 1st.:	2nd.:	3rd.;		_
Carbon Dioxi				<u> </u>					
Equipment: (HACH Digital Titrat	or CA-DT	CHEMetric	s (Range: _	mg/L)	Analysis Time:	14:25	=
Range Used;	Range	Sample Vol.	Cartridge	Multiplier]	Titration Count		Concentration	
	10-50 mg/L	200 ml	0.3636 N	0.1			x 0,1	= mg/L	
	20-100 mg/L	100 ml	0.3636 N	0.2			x 0.2	= mg/L	
	100-400 mg/L	200 ml	3.636 N	1.0			x 1.0	= mg/L	
▽	200-1000 mg/L	100 ml	3,636 N	2.0		707	x 2.0	= 2 14 mg/L	
CHEMetrics:	mg/L				_				_
Notes:									_
Standard Additions	s: Titrar	nt Molarity:		Digits Req	uired: 1st.:	2nd.:	3rd.:		



FIELD ANALYTICAL LOG SHEET

GEOCHEMICAL PARAMETERS

Page $\frac{2}{2}$ of $\frac{3}{2}$ Tetra Tech NUS, Inc. 3666M0401 00036 Project Site Name: Sample ID No.: DOWNOR OND Sample Location: Project No.: Sampled By: Duplicate: Field Analyst: Blank: Field Form Checked as per QA/QC Checklist (initials): SAMPLE COLLECTION/ANALYSIS INFORMATION: Sulfide (S²): HS-C Color Chart Analysis Time: DR-700 HS-WR Color Wheel Equipment: Program/Module: 610nm Other: 0,06 Concentration: mg/L Filtered: Notes: Sulfate (S042): Equipment: DR-700 DR-8__ Other: Analysis Time: Program/Module: 91 Concentration: mg/L Filtered: Standard Solution: Results: Standard Additions: Digits Required: 0.1ml: 0.2ml: __ 0.3ml:___ Notes: 14:48 Nitrite (NO2 -N): Analysis Time: Filtered: Other: Equipment: DR-700 Program/Module: 0,07 Reagent Blank Correction: Concentration: Standard Solution: Results: Notes: Nitrate (NO₃ -N): Analysis Time: Filtered: Equipment: DR-700 DR-8__ Other: Program/Module: Concentration: ma/L Nitrite Interference Treatment: L Reagent Blank Correction: Standard Solution: Results: Digits Required: 0.1ml: Standard Additions: 0,2ml: 0.3ml: Notes:



Page $\underline{\mathcal{I}}$ of $\underline{\mathcal{I}}$ Tetra Tech NUS, Inc. CNC 36 36 GLM0601 Sample ID No.: Project Site Name: Sample Location: Project No.: Duplicate: Sampled By: メス Blank: Field Analyst: Field Form Checked as per QA/QC Checklist (initials): SAMPLE COLLECTION/ANALYSIS INFORMATION: Manganese (Mn2+): 14:35 DR-85 HACH MN-5 Equipment: DR-700 Other: Analysis Time: Program/Module: 525nm Concentration: mg/L Filtered: Digestion: Standard Solution: Reagent Blank Correction: Results: Standard Additions: Digits Required: 0.1ml: 0.2ml: 0.3ml: Notes: Ferrous Iron (Fe²⁺): DR-700 IR-18C Color Wheel Equipment: Program/Module: 500nm 0.92 Concentration: mg/L Filtered: Notes: Hydrogen Sulfide (H2S): Equipment: Other: Concentration: mg/L Exceeded 5.0 mg/L range on color chart: Notes: QA/QC Checklist: All data fields have been completed as necessary: Correct measurement units are cited in the SAMPLING DATA block: Mulitplication is correct for each Multiplier table: Final calulated concentration is within the appropriate Range Used block: Alkalinity Relationship is determined appropriatly as per manufacturer instructions: QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: Nitrite Interference treatment used for Nitrate test if Nitrite was detected:

Title block is initialized by person who performed the QA/QC Ckecklist:

Page	of	;

Well: NC36 MWZ	Depth to Bottom (ft.): [2-8]	Responsible Personnel:
Site:	Static Water Level Before (ft.): (.) ()	Drilling Co.:
Date installed: \(\sq \q \)	Static Water Level After (ft.):	Project Name:
Date Developed: 8 11 95	Screen Length (ft.):	Project Number:
Dev. Method:	Specific Capacity:	
Pump Type:	Casing ID (in.):	

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	рН	Specific Conductance (Units)	Turbidity (NTU)	Remarks (odor, color, etc.)
1539		J		34.6	6.88	7.29	274	dt grag
1544		8		28.4	7.18	-1183	999),
1546		15		28.7	7.19	2.13	324	
1549		2,4		28.6	2.14	2.13 2.14	149	1.
ÍSSI		32		28.7	719	色	Ø	
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Site: Date Installed: 8 6 55 Date Developed: 8 11 55	Depth to Bottom (ft.): 12.69 Static Water Level Before (ft.): 5.15 Static Water Level After (ft.): Screen Length (ft.): Specific Capacity:	Responsible Personnel: Drilling Co.: Project Name: Project Number:
Dev. Method:	Specific Capacity:	
Pump Type:	Casing ID (in.):	

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Reedings (Ft. below TOC)	Temperature (Degrees C)	рН	Specific Conductance (Units)	Turbidity (NTU)	D 0	Remarks dor, color, etc.)
1520		11		29.7	6.79	3.46	999	1.70	clk y gray
1527		15		28.6	6.87	3.75	57	2.37	dkyčena
153¢		252		28.9	7.04	4.64	9		11
532		30		28.7	7,54	2-1.01	/ Ø	241	Me gray but ile
		,				•			<u> </u>
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		 			<u> </u>		<u> </u>		
		<u> </u>		ļ <u>_</u>	<u>'</u>	<u> </u>			ì
					<u> </u>				
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<u></u>								1	
	1	1-							

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· - D -		:

Well: <u>cnc36 mula</u>	Depth to Bottom (ft.): (2.80	Responsible Personnel: 2 Anderson
Site: Building 687 (alley)	Static Water Level Before (ft.): 4,04	Drilling Co.: (-5 tem
Date Installed:	Static Water Level After (ft.):	Project Name:
Date Developed: 8 20199	Screen Length (ft.):	Project Number:
Dev. Method: Task Pung	Specific Capacity:	
Pump Type:	Casing ID (in.):	

Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gal.)	Water Level Readings (Ft. below TOC)	Tamperature (Degrees C)	pH 	Specific Conductance (Units)	Turbidity (NTU)		Remarks (odor, color, etc.)
	3		281	6.75	1.48	253		
	7		28.0	703	1.19	16		
							<u> </u>	
						<u> </u>	<u> </u>	
							<u> </u>	
							<u> </u>	<u> </u>
							<u> </u>	
							 	
	_	<u> </u>					 	···-
							 	
							(121	Arrival
		·					1126	Ow.
 -		<u></u>					1136	Depairt
						······································	-	
								, -
								
<u>.</u>								
	Sediment Thickness	Sediment Water Thickness Volume (Ft.) (Gal.)	Sediment Water Readings Thickness (Ft. below TOC) (Ft.) (Gal.) 3	Sediment Thickness (Ft.) Volume (Gal.) 3 281 7 28.0	Sediment Thickness (Ft.) (Gal.) Readings (Degrees C) (Ft. below TOC) 3 281 6.73 7 28.0 7.03	Sediment Water Readings (Degrees C) Conductance (Units)	Sediment Thickness (Ft.) Water Volume (Gal.) Readings (Ft. below TOC) Conductance (Units) (NTU)	Sediment Water Readings (Degrees C) Conductance (NTU)

Page ___ of ____

Date Installed: Static Water Level After (ft.): Project Neme: Date Developed: 8-17-99 Screen Length (ft.): Project Number: Dev. Method: Trust Pump Specific Capacity: Casing ID (in.):	Trush Pump Specific Capacity:	
--	-------------------------------	--

Time	Estimated Sediment Thickness (Ft.)	Cumulative Water Volume (Gel.)	Water Level Readings (Ft. below TOC)	Temperature (Degrees C)	рΗ	Specific Conductance (Units)	Turbidity (NTU)	Remarks (odor, color, etc.)
1514		থ		29.7	9.28	339	999	1311 Shortal Pune
<u></u>		6		31.1	7.67	16.5	999	1501 Arr. well
1520		9		31,2	6:74	25.2	740	
15 23		اگ		31.6	6.61	28.8	238	HOO grey sulfurismalls.
1526		14		31.7	458	303	139	
1530		15		32.0	0.50	31.3	95	Brown Ho O Sontyresidue
1534		17		32.0	6.49	32.1	47	
								Loon's DW CNEZG MW7D
								17 galla = Dativel
					<u>-</u>		 	8-17-94
		 	 		<u> </u>	<u> </u>	 	1540 Dapart site
		ο.						

APPENDIX D

SOIL AND GROUNDWATER LABORATORY ANALYTICAL DATA

Samples Collected: Samples Received:

nples Analyzed:

5/25/99-8/11/99 5/25/99-8/11/99

5/25/99-8/11/99 5/25/99-8/11/99

Received by: Analyzed by: Reported by: RB/BL/GB SGN/ESM/DJM SGN/ESM/DJM SGN/ESM/DJM Client: TetraTech

Client Address:

mples Reported:
Project Identification:
Columbia Job Code:

Purchase Order:

8/12/99 Chas. Navy Complex TTP03249

Report Revision: Method Deviations:

Collected by:

0.0 None

Client Contact: Pa

Paul Calligan (850) 656-5458

Sampling Method: Direct Push Client Fax:

USEPA Method 8020/8015M Soil Analysis Results

Sample Names	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethylbenzene (ug/Kg)	m&p-Xylene (ug/Kg)	o-Xylene (ug/Kg)	Naphthalene (ug/Kg)	DRO (mg/Kg)	Analyst
36SFB010304	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB020506	ND	200	ND	603	1342 E	4440 E	424	SGN
36SFB030506	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB040506	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB050506	ND	ND	ND	ND	117	198	491	SGN
36SFB060506	ND	ND	ND	ND	ND	192	ND	SGN
36SFB070506	ND	ND	70.2	38.4 J	16.2 J	114	ND	SGN
FB080607	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB090304	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB100405	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB110506	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB120405	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB130304	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB140304	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB150304	ND	ND	ND	ND	ND	ND	ND	SGN
36SFB160304	ND	ND	ND	ND	ND	ND	ND	SGN

Samples Collected: Samples Received:

Project Identification:

Columbia Job Code:

5/25/99-8/11/99 5/25/99-8/11/99 Samples Analyzed: Samples Reported:

5/25/99-8/11/99 8/12/99

TTP03249

Chas. Navy Complex Report Revision:

Collected by: Received by: Analyzed by: Reported by:

RB/BL/GB SGN/ESM/DJM SGN/ESM/DJM SGN/ESM/DJM 0.0

Direct Push

None

Client:

Client Address:

Client Contact: Paul Calligan Client Phone: (850) 656-5458 Client Fax:

Purchase Order:

Sampling Method:

Method Deviations:

USEPA Method 8020/8015M Water Analysis Results

Sample Names	Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	m&p-Xylene (ug/L)	o-Xylene (ug/L)	Naphthalene (ug/L)	DRO (mg/L)	Analyst
36GFB010406	ND	11.8	ND	20.6	18.7	68.8	ND	SGN
36GFB020608	15.2	30.0	20.3	22.9	87.3	467	6.3	SGN
36GFB030608	24.6	88.9	40.5	22.7	96.5	137	6.2	SGN
36GFB040608	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB050608	ND	ND	ND	ND	ND	15.0	ND	SGN
36GFB060508	159**	1620**	805**	1700**	2000**	21300 E**	36.9	SGN
36GFB070608	73.6 J**	159**	300**	342**	470**	14300 E**	216	SGN
36GFB080708	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB090408	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB100512	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB110608	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB120508	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB130512	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB140508	ND	ND	ND	ND	ND	ND	ND	SGN
38GFB150610	ND	ND	ND	ND	ND	ND	ND	SGN
36GFB160610	ND	ND	ND	ND	ND	ND	ND	SGN
(**10x dilution)								

(**10x dilution)



October 20, 1999

Mr. Paul Calligan

Tetra Tech Nus

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308



RE: Katahdin Lab Number:

WP4035

Project ID:

CNC Charleston

Project Manager:

Ms. Andrea J.Colby

Sample Receipt Date(s):

9/22/99

Dear Mr. Calligan:

Please find enclosed the following information:

- * Report of Analysis
- * Quality Control Data Summary
- * Chain of Custody
- * Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

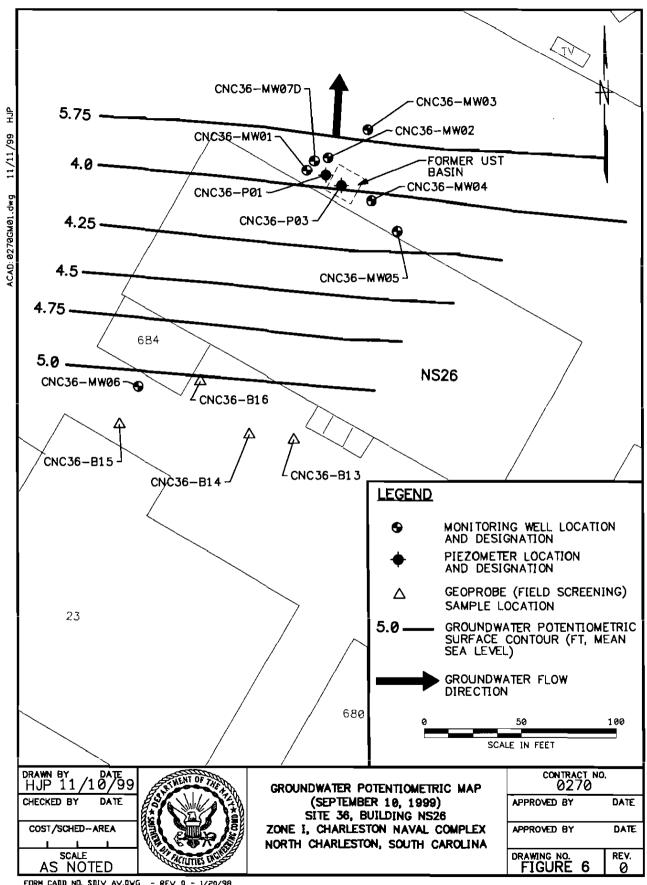
We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Authorized Signature

Date | 0 | 20 | 99





SDG NARRATIVE KATAHDIN ANALYTICAL SERVICES TETRA TECH NUS CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 22, 1999 and were logged in under Katahdin Analytical Services work order number WP4035 for a hardcopy due date of October 22, 1999.

TTNUS	GEL
Sample Identification	Sample Identification
22GLM0301	
22GLM0401	
22GLM0601	
25GLM0101	
25GLM0501	
25GLM0501D	
25GLX0201	
25GLX0401	
22GLM0301D	
25TL00201	
36SLB020405	9909644-05
36SLB050405	9909644-06
36SLB030405	9909644-07
	Sample Identification 22GLM0301 22GLM0401 22GLM0601 25GLM0101 25GLM0501 25GLM0501D 25GLX0201 25GLX0401 22GLM0301D 25TL00201 36SLB020405 36SLB050405

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Three soil/sediment and ten aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 22, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5973-U (aqueous), 5970-Q (aqueous), and 5972-M (low level soils) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.



Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. No matrix spike/matrix spike duplicate analysis was performed on any of the samples in this workorder.

Analyses of samples WP4035-1 and -9 yielded concentrations of 1,1-dichloroethane over the upper limit of the calibration curve. Since this analyte was not requested by the client to be reported, no laboratory action was taken.

Initial analyses of samples WP4035-5 and -6 were performed at 1:50 dilutions due to the matrix, with target analyte concentrations still over the upper limit of the calibration curve, as well as surrogate recovery deviations. Reanalyses occurred at 1:200 dilutions successfully. For each sample, both sets of data are included in this data package.

Several manual integrations were performed due to split peaks, all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Three soil/sediment and nine aqueous samples were received by Katahdin Analytical Services laboratory on September 22, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on September 24 and 27, 1999. A laboratory control spike was extracted in each batch. Extraction of all of the aqueous samples occurred following USEPA method 3510 on September 23, 1999. A laboratory control sample/laboratory control sample duplicate was extracted in the batch.

Initial analyses of samples WP4035-5 and -6 yielded target analyte concentrations over the upper limit of the calibration curve. Reanalyses occurred at 1:4 dilutions successfully. For each sample, both sets of data are included in this data package.

Initial analysis of sample WP4035-3 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in the data package for this sample.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.



No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP4035 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Aqueous-matrix Katahdin Sample Nos. WP4035-(1-9) were digested for ICP analysis on 09/24/99 (QC Batch PI24ICW1) in accordance with USEPA Method 3010A. Katahdin Sample No. WP4035-3 was prepared with duplicate matrix-spiked aliquots during digestion.

Soil-matrix Katahdin Sample Nos. WP4035-(11-13) were digested for ICP analysis on 10/01/99 (QC Batch PJ01ICS0) in accordance with USEPA Method 3050B. The measured calcium (16.3 mg/kg) and sodium (11.5 mg/kg) concentrations of the preparation blank that is associated with this QC batch exceed the laboratory's acceptance limits. However, because the measured calcium and sodium concentrations of all associated samples are more than ten times those of the preparation blank, no corrective action was required.

ICP analyses of Katahdin Work Order WP4035 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Aqueous-matrix Katahdin Sample Nos. WP4035-(1, 2, 3, 9) were digested for mercury analysis on 09/25/99 (QC Batch PI25HGW0) in accordance with USEPA Method 7470A.

Soil-matrix Katahdin Sample Nos. WP4035-(11-13) were digested for mercury analysis on 10/07/99 (QC Batch PJ07HGS1) in accordance with USEPA Method 7471A. Katahdin Sample No. WP4035-11 was prepared with duplicate matrix-spiked aliquots.

Mercury analyses of Katahdin Work Order WP4035 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.



Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved for work order WP3906 by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) and Sulfate analyses (375.4) were performed according to the U.S. EPA, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, 1979, Revised 1983. Sulfate analyses (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. Analyses for Solids-Total Residue (TS) have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All samples were analyzed within analytical hold times. No protocol deviations were noted by the Wet Chemistry laboratory staff.

KATAHD ANALYTICAL SERVICE SAMPLE RECEIPT CONDITION REI Tel. (207) 874-2400 Fax (207) 775-4029 CLIENT: TETRATETH WUS	PORT	·. 			594035 OF 3 OF 3
1. CUSTODY SEALS PRESENT / INTACT? 2. CHAIN OF CUSTODY PRESENT IN THIS COOLER? 3. CHAIN OF CUSTODY SIGNED BY CLIENT?	YES D	2 0 0	EXCEPTIONS	COMMENTS	RESOLUTION
4. CHAIN OF CUSTODY MATCHES SAMPLES? 5. TEMPERATURE BLANKS PRESENT? 6. SAMPLES RECEIVED AT 4°C +/- 2? CE IICE PACKS PRESENT				TEMP BLANK TEMP (°C)= /. O COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP B	ASC notified Vanlalligan flox 9/22/89 LANK IS NOT PRESENT
7. VOLATILES FREE OF HEADSPACE? 8. TRIP BLANK PRESENT IN THIS COOLER 9. PROPER SAMPLE CONTAINERS AND VOLUME? 10. SAMPLES WITHIN HOLD TIME UPON RECEIPT? 11. SAMPLES PROPERLY PRESERVED ⁽¹⁾ ?		40000			
	MMERCIAL	CLP HA		The soly container ->	>2.0
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Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of nH check if required. If samples required pH adjustment, record volume and type of preservative added

KATAHDIN ANALYTICAL SERVICES,	INC.			L	AB (WORK ORDER)#_	WP4035
SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400	RT				AGE:2	OF 3
Fax (207) 775-4029		··•		C	00LER:	OF 3
CLIENT: 1- TECH NUS					COC#	
7= 100 11 100 S		-		E	DATE / TIME RECEIVED	
. —					DELIVERED BY: RECEIVED BY:	PEDEX BKR
PROJECT: <u>CTO 68</u>	•	_		L	IMS ENTRY BY:	BEU A)
					.IMS REVIEW BY / PM:_	
1. CUSTODY SEALS PRESENT / INTACT?	YES	NO	EXCEPTIONS	COMMENT	rs	RESOLUTION
2:CHAIN OF CUSTODY PRESENT IN THIS COOLER?		4				
3. CHAIN OF CUSTODY SIGNED BY CLIENT?				,		_
4. CHAIN OF CUSTODY MATCHES SAMPLES?						The state of the s
5. TEMPERATURE BLANKS PRESENT?				TEMP BLA	ANK TEMP (°C)=	Lox 9/22/99
6. SAMPLES RECEIVED AT 4°C +/- 2? CB/ICE PACKS PRESENT (Y)or N?						MP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?	3					
8. TRIP BLANK PRESENT IN THIS COOLER		1				
9. PROPER SAMPLE CONTAINERS AND VOLUME?	₫					
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?		~ 		•		
11. SAMPLES PROPERLY PRESERVED(1)?	3					
12. CORRECTIVE ACTION REPORT FILED?		3	N/A	-		
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	ERCIAL	CLP HAZ	WRAP (NFESC)	ACOE AFCEE	OTHER (STATE OF ORIGIN)	<u>. </u>
LOG - IN NOTES ⁽¹⁾ :	<u> </u>	-				
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KATAHDIN ANALYTICAL SERVICE				×.		LAB (WORK ORDER) #	WP 4035
SAMPLE RECEIPT CONDITION RE Tel. (207) 874-2400 Fax (207) 775-4029	PORI						_of <u>3</u>
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CLIENT: - TECHNUS		_				COC#	20 27 854 8630
÷						DELIVERED BY:	09-27-99-0930 FED FY
CTD 18						RECEIVED BY:	BUL
PROJECT: CTD 68						LIMS ENTRY BY:	BEK
	-					LIMS REVIEW BY / PM:	MC
	YES	NO	EXCEPTIONS		COMME	NTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	₽						
2:CHAIN OF CUSTODY PRESENT IN THIS COOLER	17	प			<u> </u>		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	प्				· 		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	<u>a</u>			•			
5. TEMPERATURE BLANKS PRESENT?	ď				темр в	LANK TEMP (*C)= 0.6	tol notified voul Calliga
6. SAMPLES RECEIVED AT 4°C +/- 27 VEV ICE PACKS PRESENT (7) N7		प			COOLE	R TEMP ("C)= NA	
7. VOLATILES FREE OF HEADSPACE?							
8. TRIP BLANK PRESENT IN THIS COOLER		3					
9. PROPER SAMPLE CONTAINERS AND VOLUME?	<u> </u>						
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT		~ 🔲					
11. SAMPLES PROPERLY PRESERVED ⁽¹⁾ ?	ď				_	_	
12. CORRECTIVE ACTION REPORT FILED?		a	N/A				
13. ANALYTICAL PROGRAMS (CIRCLE ONE) CO	MMERCIAL	CLP HA	ZWRAP (NPESO	ACOE	AFCEE	OTHER (STATE OF ORIGIN):	
LOG - IN NOTES ⁽¹⁾ :							
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Use this space (and additional sheets if necessary) to document eamples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of nH check if required. If samples required pH adjustment, record volume and type of presentative added



CHAIN of CUSTODY

	07) 874-2400 207) 775-4029			PLEAS	SE PRINT	IN PEN	Pag	e of _
Client TETRA TECH	Nus	Contact PAUL (au 6	Phone # もん(850		9899	Fax # ()	
Address 1401 OVEN PAR		TAUA		-	PL		Code Sa	 ₹0L
Purchase Order #		No. OSIC			ı	Katahdin Qu		-
Bill (if different than above) 813	458369319	Address						
Sampler (Print / Sign) Thomas	_	How	,		Copies	То:		
LAB USE ONLY WORK ORDER	" WP4035" -	*		ANALY	PRESERV			
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22 GLM Ø3 Ø1 D	7-21-98/0000 GW	63	a	J				
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Katahdin	340 County Road No. 5 P.O. Box 720 Westbrook, ME 04098
ANALYTICAL SHRVICES	Tel: (207) 874-2400 Fax: (207) 775-4029

CHAIN of CUSTODY

Tel: (207) 874-2400 Fax: (207) 775-4029		PLEASE PRINT IN PEN Page of									
Tetra Tech NUS	Contac	01 L Cal	ligan	F ('hone # \$43)	554 .	-494	Fa S (x #)		
Add NH-21 Ave H City	Port	ch	ovlusti	S	tate S	,C-		Zip Cod	e		
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Bill (if different than above)		ddress		•••			7				
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LAB USE ONLY WORK ORDER #: WP 4035 -	•			/	ANALYSI	S AND C PRESER			Œ		
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MISOURCE INC. ☎ (207) 782-3311	-							— -			

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 1

ORDER NO WP-4035 Project Manager: Andrea J. Colby

ORDER DATE: 09/22/99

PHONE: 850/385-98

REPORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

FAX: 850/385-98. DUE: 22 OCT

FAC.ID: CNC CHARLESTON

INVOICE: ACCOUNTS PAYABLE

TETRA TECH NUS, INC.

PHONE: 412/921-7090

PO: N7912-P99264

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220

PROJECT: CTO #68

SAMPLED BY: T.THOMPSON

DELIVERED BY: FEDEX

DISPOSE: AFTER 21 NOV

ITEM LOG NUMBER SAMPLE DESCRIPTION	SAMPLED DATE	/TIME	RECEIVE	MATRIX
1 WP4035-1 22GLM0301	21 SEP	1137	22 SEI	P AQ
WP4035-2 22GLM0401	21 SEP	1149		
WP4035-3 22GLM0601	21 SEP	1104		
DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Target Analyte List Metals, Total		3	100.00	300.0 0
Nitrate as N	353.2	3	30.00	90.00
Sulfate	375.4	3	0.00	0.00
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
Methane Subcontract		3	95.00	285.00
TOTALS	-	3	425.00	1275.00

2	LOG NUMBER WP4035-6 WP4035-7 WP4035-8	SAMPLE DESCRIPTION 25GLM0501D 25GLX0201 25GLX0401	SAMPLED DATE, 21 SEP 21 SEP 21 SEP	1615	RECEIVED 22 SEP	MATRIX AQ
	DETERMINATION	ON	METHOD	QTY	PRICE	AMOUNT
	Volatile Or	ganics by 8260B	SW8260	3	75.00	225.00
	Polynuclear	Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
	Lead, Total		200.7/6010	3	20.00	60.00

TOTALS 3 220.00 660.00

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 2

Project Manager: Andrea J. Colby ORDER NO WP-4035 ORDER DATE: 09/22/99 PROORT TO: Paul Calligan PHONE: 850/385-9899 Tetra Tech NUS FAX: 850/385-9860 1401 Oven Park Dr., Suite 102 DUE: 22 OCT FAC.ID: CNC CHARLESTON Tallahassee, FL 32308 ACCOUNTS PAYABLE PHONE: 412/921-7090 INVOICE: PO: N7912-P99264 TETRA TECH NUS, INC. FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220 PROJECT: CTO #68 SAMPLED BY: T.THOMPSON DELIVERED BY: FEDEX DISPOSE: AFTER 21 NOV SAMPLED DATE/TIME LOG NUMBER SAMPLE DESCRIPTION RECEIVED MATRIX 21 SEP 0000 22 SEP WP4035-9 22GLM0301D AQ DETERMINATION METHOD QTY PRICE AMOUNT Volatile Organics by 8260B SW8260 1 75.00 75.00 Polynuclear Aromatic Hydrocarbons EPA 8270 125.00 1 125.00 Target Analyte List Metals, Total 1 100.00 100.00 TOTALS 1 300.00 300.00 SAMPLED DATE/TIME LOG NUMBER SAMPLE DESCRIPTION RECEIVED MATRIX 21 SEP 22 SEP WP4035-10 25TL00201 AO. METHOD DETERMINATION PRICE AMOUNT Volatile Organics by 8260B SW8260 75.00 1 75.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED 21 SEP 1600 22 SEP WP4035-11 36SLB020405 SLWP4035-12 36SLB050405 21 SEP 1120 WP4035-13 36SLB030405 21 SEP 1430 OTY DETERMINATION METHOD PRICE AMOUNT SW8260 Volatile Organics by 8260B 3 85,00 255.00 Solids-Total Residue (TS)
Polynuclear Aromatic Hydrocarbons CLP/CIP SO 3 0.00 0.00 EPA 8270 3 135.00 405.00 Target Analyte List Metals, Total 3 100.00 300.00 TPH Subcontract 3 225.00 75.00

TOTALS

395.00

1185.00

KATAHDIN ANALYTICAL SERVICES, INCORPORATED New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 3

ORDER NO WP-4035

Project Manager: Andrea J. Colby

ORDER DATE: 09/22/99

REPORT TO: Paul Calligan

PHONE: 850/385-98

Tetra Tech NUS

FAX: 850/385-98L

1401 Oven Park Dr., Suite 102

DUE: 22 OCT

Tallahassee, FL 32308

FAC. ID: CNC CHARLESTON

INVOICE: ACCOUNTS PAYABLE PHONE: 412/921-7090

TETRA TECH NUS, INC.

PO: N7912-P99264

FOSTER PLAZA 7, 661 ANDERSEN DR.

PROJECT: CTO #68

PITTSBURGH, PA 15220

SAMPLED BY: T.THOMPSON

DELIVERED BY: FEDEX

DISPOSE: AFTER 21 NOV

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
6	WP4035-4	25GLM0101	21 SEP 1205	22 SEP	AQ
	WP4035-5	25GLM0501	21 SEP 1705		

DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	2	75.00	150.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	2	125.00	250.00
Methane Subcontract		2	95.00	190.00
Nitrate as N	353.2	2	30.00	60.00
Sulfate	375.4	2	0.00	0.00
Lead, Total	200.7/6010	2	20.00	40.00
TOTALS		2	345.00	690.00

ORDER NOTE: QC-II+ W/NARRATIVE

> DD (KAS007QC-DB3) CNC CHARLESTON

REPORT COPY: MS. LEE LECK

TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR. PITTSBURGH, PA 15220

REPORT & DISK

INVOICE: With Report

TOTAL ORDER AMOUNT \$4,185.

This is NOT an Invo. -

AJC/BKR/WEST.AJC(dw)

09-29Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note	Note Text
#	# flag denotes surrogate compound recovery is out of criteria.
В	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
0-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
DL	'DL' flag denotes inability to calculate surrogate recovery due to sample dilution.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J .	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
0-13	Internal standard area(s) are out of criteria. Reanalysis confirmedmatrix interference.
0-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB020405

Matrix: SOIL

SDG Name:

WP4035

Percent Solids: 75.5

Lab Sample ID: WP4035-011

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	16500			P	1
7440-36-0	ANTIMONY	0.26	В		P	1
7440-38-2	ARSENIC	7.8			P	1
7440-39-3	BARIUM	28.0			P	1
7440-41-7	BERYLLIUM	0.58			P	1
7440-43-9	CADMIUM	0.28	В		P	1
7440-70-2	CALCIUM	69900			P	5
7440-47-3	CHROMIUM	108			P	1
7440-48-4	COBALT	2.9	В		P	1
7440-50-8	COPPER	17.0			P	1
7439-89-6	IRON	11100			P	1
7439-92-1	LEAD	33.0			P	1
7439-95-4	MAGNESIUM	5000			P	1
7439-96-5	MANGANESE	148			P	1
7439-97-6	MERCURY	0.17			CV	1
7440-02-0	NICKEL	12.7			P	1
7440-09-7	POTASSIUM	1120			P	1
7782-49-2	SELENTUM	1.0	В		P	1
7440-22-4	SILVER	0.30	U		P	1
7440-23-5	SODIUM	648			P	1
7440-28-0	THALLIUM	0.52	U		P	1
7440-62-2	VANADIUM	29.4			P	1
7440-66-6	ZINC	. 76.4			P	1



CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number : WP-4035-11

Report Date: 10/20/99

PO No.

: N7912-P99264

Project

: CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 4 of 8

SAMPLE DESCRIPTION		MATRIX			ED BA	SAMPLED	SAMPLED DATE		
36SLB020405	95 Solid		T. THOMPSON			09/21/	09/21/99		
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES	
Solids-Total Residue (TS)	75.	wt %	1.0	0.10	CLP/CIP :	SOW 09/28/99	JF	1	

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 09/27/99 by JF

10/20/99

LJO/ejnajc(dw)/msm P127TSS4 CC: MS. LEE LECK TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4035-11

SDG:

WP4035

Report Date:

10/7/99

PO No.:

N7912-P99264

Project: % Solids: CTO #68 75

Method:

EPA 8270

Date Analyzed: 9/29/99

Sample Description	Matrix S	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst	
36SLB020405	SL	SL 9/21/99		9/24/99	DPD	EPA 3550	KRT	
Compound	Resu	it Units	ĐĒ	Sample PQL	Method PQL			
NAPHTHALENE	<43(ug/Kg	1.3	430	330			
2-METHYLNAPHTHALENE	<430	ug/Kg	1.3	430	330			
ACENAPHTHYLENE	<430	ug/Kg	1.3	430	330			
ACENAPHTHENE	<430	ug/Kg	1.3	430	330			
FLUORENE	<430	ug/Kg	1.3	430	330			
PHENANTHRENE	J270	ug/Kg	1.3	430	330			
ANTHRACENE	<430) ug/Kg	1.3	430	330			
FLUORANTHENE	J390	ug/Kg	1.3	430	330			
PYRENE	J390	ug/Kg	1.3	430	330			
BENZO[A]ANTHRACENE	<430	ug/Kg	1.3	430	330			
CHRYSENE	<430	ug/Kg	1.3	430	330			
BENZO[B]FLUORANTHENE	J220	ug/Kg	1,3	430	330			
BENZO[K]FLUORANTHENE	<430	ug/Kg	1.3	430	330			
BENZO[A]PYRENE	<430	ug/Kg	1.3	430	330			
INDENO[1,2,3-CD]PYRENE	<430	ug/Kg	1.3	430	330			
DIBENZ[A,H]ANTHRACENE	<430	ug/Kg	1.3	430	330			
BENZO[G,H,I]PERYLENE	<430	ug/Kg	1,3	430	330			
NITROBENZENE-D5	73	%	1.3					
2-FLUOROBIPHENYL	81	%	1.3					
TERPHENYL-D14	85	%	1.3					

.... Report Notes:



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

Report Date:

WP4035-11

SDG:

WP4035 10/6/99

PO No. :

N7912-P99264

Project:

CTO #68

% Solids:

75

Method:

SW8260

Date Analyzed: 9/28/99

Sample Description	Matrix	Sam	pled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst.		
36\$LB020405	SL	SL 9/21/99		9/22/99	9/28/99	НМР	5030	HMP		
Compound	Re	esuit	Units	DF	Sample PQL	Method PQL				
BENZENE		<7	ug/Kg	1.4	7	5				
TOLUENE		<7	ug/Kg	1.4	7	5				
1,2-DIBROMOETHANE		<7	ug/Kg	1.4	7	5				
ETHYLBENZENE		<7	ug/Kg	1.4	7	5				
NAPHTHALENE		<7	ug/Kg	1.4	7	5				
MTBE		<7	ug/Kg	1.4	7	5				
TOTAL XYLENES		<7	ug/Kg	1.4	7 .	5				
DIBROMOFLUOROMETHANE	1	101	%	1.4						
1,2-DICHLOROETHANE-D4	!	97	%	1.4						
TOLUENE-D8	,	96	%	1.4						
P-BROMOFLUOROBENZENE		B1	%	1.4						

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services Client Field ID: 36SLB050405

Matrix: SOIL SDG Name: WP4035

Percent Solids: 70.0 Lab Sample ID: WP4035-012

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF	_
7429-90-5	ALUMINUM	8440			P	1	
7440-36-0	ANTIMONY	0.23	В		P	1	
7440-38-2	ARSENIC	8.6			P	1	
7440-39-3	BARIUM	13.3			P	1	
7440-41-7	BERYLLIUM	0.52	В		P	1	
7440-43-9	CADMIUM	0.40	В		P	1	
7440-70-2	CALCIUM	186000			P	5	
7440-47-3	CHROMIUM	42.3			P	1	
7440-48-4	COBALT	1.2	В		P	1	
7440-50-8	COPPER	7.8			P	1	
7439-89-6	IRON	6300			P	1	
7439-92-1	LEAD	3.0			P	1	
7439-95-4	MAGNESIUM	8930			P	1	
7439-96-5	MANGANESE	97.6			P	1	
7439-97-6	MERCURY	0.01	В		CV	1	
7440-02-0	NICKEL	23.3			P	1	
7440-09-7	POTASSIUM	1120			P	1	
7782-49-2	SELENIUM	1.9			P	1	
7440-22-4	SILVER	0.31	U		P	1	
7440-23-5	SODIUM	702			P	1	
7440-28-0	THALLIUM	0.54	U		P	1	
7440-62-2	VANADIUM	26.2			P	1	
7440-66-6	ZINC	41.8			P	1	



CLIEMT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number : WP-4035-12

Report Date: 10/20/99

PO No.

: N7912-P99264

Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 5 of 8

SAMPLE DESCRIPTION			MATRIX SA				SAMPLED :	RECEIVED	
36SLB050405		Solid T.THOMPSON			09/21/99 09/22/99				
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD		ANALYZED	BA	NOTES
Solids-Total Residue (TS)	70.	wt %	1.0	0.10	CLP/CIP	SOW	09/28/99	JF	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect samplespecific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. (1) Sample Preparation on 09/27/99 by JF

10/20/99

LJO/ejnajc(dw)/msm PI27TSS4

CC: MS. LEE LECK TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client:

Paul Calligan Tetra Tech NUS

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4035-12

SDG:

WP4035 10/7/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

70

Method:

EPA 8270

Date Analyzed: 9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB050405	SL	9/21/99	9/22/99	9/24/99	DP D	EPA 3550	KRT
Compound	Resi	ult Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	670) ug/Kg	1.4	460	330		
2-METHYLNAPHTHALENE	450	0 ug/Kg	1.4	460	330		
ACENAPHTHYLENE	<46	0 ug/Kg	1.4	460	330		
ACENAPHTHENE	<46	0 ug/Kg	1.4	460	330		
FLUORENE	590) ug/Kg	1.4	460	330		
PHENANTHRENE	120	0 ug/Kg	1.4	460	330		
ANTHRACENE	<46	0 ug/Kg	1,4	460	330		
FLUORANTHENE	<46	û ug/Kg	1.4	46 0	330		
PYRENE	<46	0 ug/Kg	1.4	460	330		
BENZO(A)ANTHRACENE	<46	0 ug/Kg	1.4	460	330		
CHRYSENE	<46	0 ug/Kg	1.4	460	330		
BENZO[B]FLUORANTHENE	<46	0 ug/Kg	1.4	460	330		
BENZO[K]FLUORANTHENE	<46	0 ug/Kg	1,4	460	330		
BENZO[A]PYRENE	<46	0 ug/Kg	1.4	460	330		
INDENO[1,2,3-CD]PYRENE	<46	0 ug/Kg	1,4	460	330		
DIBENZ[A,H]ANTHRACENE	<46	0 ug/Kg	1,4	460	330		
BENZO[G,H,I]PERYLENE	<46	0 ug/Kg	1.4	460	330		
NITROBENZENE-D5	68	%	1.4				
2-FLUOROBIPHENYL	71	. %	1.4				
TERPHENYL-D14	76	%	1.4				

Report Notes:



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4035-12

SDG:

WP4035 10/6/99

Report Date: PO No.:

N7912-P99264

Project: % Solids: CTO #68 70

Method:

SW8260

Date Analyzed: 9/28/99

Sample Description	Matrix	Sam	pled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB050405	SL	9	/21/99	9/22/99	9/28/99	НМР	5030	HMP
Compound	R	esult	Units	DF	Sample PQL	Method PQL		
BENZENE	_	<8	ug/Kg	1.6	8	5	_	
TOLUENE		<8	ug/Kg	1.6	8	5		
1,2-DIBROMOETHANE		<8	ug/Kg	1.6	8	5		
ETHYLBENZENE		<8	ug/Kg	1.6	8	5		
NAPHTHALENE	8	382	ug/Kg	1.6	8	5		
мтве		<8	ug/Kg	1.6	8	5		
TOTAL XYLENES		<8	ug/Kg	1,6	8	5		
DIBROMOFLUOROMETHANE		85	%	1.6				
1,2-DICHLOROETHANE-D4		85	%	1,6				
TOLUENE-D8		77	%	1.6				
P-BROMOFLUOROBENZENE		74	%	1.6				

Report Notes:

1

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB030405

Matrix: SOIL

SDG Name:

WP4035

Percent Solids: 76.9

Lab Sample ID: WP4035-013

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	` M	DF	
7429-90-5	ALUMINUM	15300			P	1	!
7440-36-0	ANTIMONY	0.72		-	P	1	l
7440-38-2	ARSENIC	5.5			P	1	
7440-39-3	BARIUM	26.3			P	1	ı
7440-41-7	BERYLLIUM	0.58			P	1	
7440-43-9	CADMIUM	0.30	В		P	1	
7440-70-2	CALCIUM	52200			P	5	;
7440-47-3	CHROMIUM	507			P	5	i
7440-48-4	COBALT	2.5			P	1	ļ
7440-50-8	COPPER	14.0			P	1	ı
7439-89-6	IRON	8540			P	1	
7439-92-1	LEAD	26.3			P	1	l
7439-95-4	MAGNESIUM	8930			P	1	l
7439-96-5	MANGANESE	173			P	1	ĺ
7439-97 - 6	MERCURY	0.13			CV	1	l
7440-02-0	NICKEL	12.7			P	1	l
7440-09-7	POTASSIUM	967			P	1	l
7782-49-2	SELENIUM	0.81			P	1	l
7440-22-4	SILVER	0.19	υ		P	1	ı
7440-23-5	SODIUM	528			P	1	ı
7440-28-0	THALLIUM	0.34	υ		P	1	I
7440-62-2	VANADIUM	25.9			P	1	i
7440-66-6	ZINC	62.6			P	1	i



CLIENT: Paul Calligan

WIC#: CNC CHARLESTON

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number : WP-4035-13

: N7912-P99264

Report Date: 10/20/99

Project : CTO #68

PO No.

REPORT OF ANALYTICAL RESULTS

Page 6 of 8

SAMPLE DESCRIPTION		MATRIX		SAMPL	ED BY	SAM	PLED 1	DATE	RECEIVED
36SLB030405		Solid		T.THO	MPSON	0	9/21/	99	09/22/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANA	LYZED	BY	NOTES
Solids-Total Residue (TS)	77.	wt %	1.0	0.10	CLP/CIP	SOW 09/	28/99	JF	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 09/27/99 by JF

10/20/99

LJO/ejnajc(dw)/msm PI27TSS7

CC: MS. LEE LECK TEIRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4035-13

SDG: Report Date: WP4035 10/7/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

77

Method:

EPA 8270

Date Analyzed: 9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB030405	SL	9/21/99	9/22/99	9/27/99	DAS	EPA 3550	KRT
Compound	Resi	uit Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<43	0 ид/Кд	1.3	430	330		
2-METHYLNAPHTHALENE	<430	0 ug/Kg	1.3	430	330		
ACENAPHTHYLENE	<43	0 ug/Kg	1.3	430	330		
ACENAPHTHENE	<43	0 ug/Kg	1.3	430	330		
FLUORENE	<436	0 ug/Kg	1.3	430	330		
PHENANTHRENE	<43	0 ug/Kg	1.3	430	330		
ANTHRACENE	<430	0 ug/Kg	1.3	430	330		
FLUORANTHENE	<43	0 ug/Kg	1.3	430	330		
PYRENE	<43	0 ug/Kg	1.3	430	330		
ENZO[A]ANTHRACENE	<430	0 ug/Kg	1.3	430	330		
CHRYSENE	<430	0 ug/Kg	1.3	430	330		
BENZO[B]FLUORANTHENE	<430	0 ug/Kg	1.3	430	330		
BENZO[K]FLUORANTHENE	<43		1.3	430	330		
BENZO[A]PYRENE	<430	0 ug/Kg	1.3	430	330		
INDENO[1,2,3-CD]PYRENE	<430	0 ug/Kg	1.3	430	330		
DIBENZ[A,H]ANTHRACENE	<430	0 ug/Kg	1.3	430	330		
BENZO[G,H,I]PERYLENE	<430	D ug/Kg	1.3	430	330		
NITROBENZENE-D5	56	%	1.3				
2-FLUOROBIPHENYL	60	%	1.3				
TERPHENYL-D14	64	%	1.3				

port Notes:



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Taliahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4035-13

SDG:

WP4035

Report Date:

10/6/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

77

Method:

SW8260

Date Analyzed: 9/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB030405	SL	9/21/99	9/22/99	9/28/99	HMP	5030	нмР
Compound	Res	sult Units	DF	Sample PQL	Method PQL		
BENZENE	<	7 ug/Kg	1.4	7	5	•	
TOLUENE	<	7 ug/Kg	1.4	7	5		
1,2-DIBROMOETHANE	<	7 ug/Kg	1.4	7	5		
ETHYLBENZENE	<	7 ug/Kg	1.4	7	5		
NAPHTHALENE	<	7 ug/Kg	1.4	7	5		
MTBE	<	7 ug/Kg	1.4	7	5		
TOTAL XYLENES	<	7 ug/Kg	1.4	7	. 5		
DIBROMOFLUOROMETHANE	11	10 %	1.4				
1,2-DICHLOROETHANE-D4	10	03 %	1,4				
TOLUENE-D8	11	14 %	1.4				
P-BROMOFLUOROBENZENE	10	08 %	1,4				

Report Notes:

3P PREPARATION BLANKS

Lab Name: Katahdin Analytical Services Sample ID: PBSPJ011CS0

Matrix: SOIL SDG Name: WP4035

QC Batch ID: PJ011CS0

Analyte	RESULT	С	
ALUMINUM	9.223	В	
ANTIMONY	-0.205	В	
ARSENIC	0.210	U	
BARIUM	0.061	В	
BERYLLIUM	0.020	U	
CADMIUM	0.190	U	
CALCIUM	16.324		
CHROMIUM	0.407	В	
COBALT	0.060	U	
COPPER	0.060	U	
IRON	0.669	В	
LEAD	0.110	υ	
MAGNESIUM	1.770	В	
MANGANESE	0.053	В	
NICKEL	1.320	U	
POTASSIUM	44.950	υ	
SELENIUM	0.260	U	
SILVER	0.070	U	
SODIUM	11.547		
THALLIUM	0.450	U	
VANADIUM	0.060	U	
ZINC	0.153	В	

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services

Sample ID: LCSSPJ011CS0

Matrix: SOIL

SDG Name: WP4035

QC Batch ID: PJ011CS0

	<u>`</u> _				
Analyte	TRUE	FOUND	% R	LIMIT	S (%)
ALUMINUM	5720.0	5284.82	92.4	66	134
ANTIMONY	26.6	30.85	116.0	13	186
ARSENIC	163.0	179.02	109.8	62	138
BARIUM	195.0	246.23	126.3	66	134
BERYLLIUM	78.9	86.75	109.9	72	128
CADMIUM	114.0	115.92	101.7	74	124
CALCIUM	1280.0	1286.99	100.5	70	130
CHROMIUM	175.0	202.59	115.8	69	131
COBALT	73.7	83.62	113.5	70	130
COPPER	91.0	95.87	105.4	71	128
IRON	9080.0	8892.45	97.9	53	146
LEAD	66.0	83.22	126.1	68	132
MAGNESIUM	1210.0	1178.63	97.4	73	126
MANGANESE	261.0	289.32	110.9	78	122
NICKEL	68.3	75.55	110.6	56	144
POTASSIUM	1500.0	1373.71	91.6	64	136
SELENIUM	123.0	123.79	100.6	74	126
SILVER	57.2	53.95	94.3	71	128
SODIUM	1380.0	1402.75	101.6	68	133
THALLIUM	80.0	99.81	124.8	57	142
VANADIUM	95.4	108.52	113.8	68	132
ZINC	190.0	210.74	110.9	76	124

3P PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBSPJ07HGS1

Matrix: SOIL

SDG Name: WP4035

QC Batch ID: PJ07HGS1

Analyte	RESULT	C	
MERCURY	0.010	U	

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services Sample ID: LCSSPJ07HGS1

Matrix: SOIL SDG Name: WP4035

QC Batch ID: PJ07HGS1

Analyte	TRUE	FOUND	% R	LIMITS (%)	
MERCURY	1.8	2.32	128.9	54	146

3P PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI24ICW1

Matrix: WATER

SDG Name: WP4035

QC Batch ID: Pl241CW1

Analyte	RESULT	С
ALUMINUM	19.080	В
ANTIMONY	1.810	U
ARSENIC	2.070	U
BARIUM	1.810	В
BERYLLIUM	0.330	U
CADMIUM	1.940	U
CALCIUM	27.640	В
CHROMIUM	4.310	U
COBALT	4.450	U
COPPER	1.620	U
IRON	8.920	В
LEAD	1.090	U
MAGNESIUM	17.160	U
MANGANESE	0.970	U
NICKEL	13.210	U
POTASSIUM	449.540	U
SELENIUM	2.570	U
SILVER	2.540	U
SODIUM	84.140	В
THALLIUM	4.490	U
VANADIUM	3.580	U
ZINC	5.190	В

7 LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services Sample ID: LCSWPI241CW1

Matrix: WATER SDG Name: WP4035

QC Batch ID: PI241CW1

Analyte	TRUE	FOUND	% R	LIMIT	S (%)
ALUMINUM	2000.0	1957.03	97.9	80	120
ANTIMONY	500.0	501.39	100.3	80	120
ARSENIC	2000.0	1935.06	96.8	80	120
BARIUM	2000.0	2102.62	105.1	80	120
BERYLLIUM	50.0	52.87	105.7	80	120
CADMIUM	50.0	53.05	106.1	- 80	120
CALCIUM	2500.0	2678.37	107.1	80	120
CHROMIUM	200.0	212.83	106.4	80	120
COBALT	500.0	527.54	105.5	80	120
COPPER	250.0	248.67	99.5	80	120
IRON	1000.0	1070.93	107.1	80	120
LEAD	500.0	550.63	110.1	80	120
MAGNESIUM	5000.0	4828.88	96.6	80	120
MANGANESE	500.0	. 527.50	105.5	80	120
NICKEL	500.0	539.85	108.0	80	120
POTASSIUM	25000.0	23749.69	95.0	80	120
SELENTUM	2000.0	1853.45	92.7	80	120
SILVER	50.0	43.11	86.2	80	120
SODIUM	7500.0	7501.04	100.0	80	120
THALLIUM	2000.0	2216.78	110.8	80	120
VANADIUM	500.0	524.53	104.9	80	120
ZINC	500.0	499.80	100.0	80	120

3P PREPARATION BLANKS

Lab Name: Katahdin Analytical Services Sample ID: PBWPI25HGW0

Matrix: WATER SDG Name: WP4035

QC Batch ID: PI25HGW0

Analyte	RESULT	С	
MERCURY	0.020	υ	

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services

Sample ID: LCSWPI25HGW0

Matrix: WATER

SDG Name: WP4035

QC Batch ID: Pl25HGW0

Analyte	TRUE	FOUND	% R	LIMIT	S (%)
MERCURY	5.0	4.86	97.2	80	120

5A SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services Client Field ID: 22GLM0601S

Matrix: WATER SDG Name: WP4035

Percent Solids: 0.00 Lab Sample ID: WP4035-003S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked	Sample		Spike			Control Lin	nits (%R)	
Analyte	Sample Result C	Result	C	Added	%R	Q	Low	High	M
ALUMINUM	2346.3500	136.5400		2000	110.5	_	75	125	P
ANTIMONY	545.4400	-1.4000	U	500	109.1		75	125	P
ARSENIC	2239.4800	6.0600	В	2000	111.7		75	125	P
BARIUM	2226.8100	65.3700		2000	108.1		75	125	P
BERYLLIUM	55.9100	0.2500	U	50	111.8		75	125	P
CADMIUM	59.5000	1.0800	U	50	119.0		75	125	P
CALCIUM	395830.5000	397131.8300		2500	-52.1		75	125	P
CHROMIUM	216.7400	-3.8000	U	200	108.4		75	125	P
COBALT	642.8200	102.4300		500	108.1		75	125	P
COPPER	269.6900	-0.9900	U	250	107.9		75	125	P
IRON	18672.9600	17767.2500		1000	90.6		75	125	P
LEAD	527.4600	1.3400	В	500	105.2		75	125	P
MAGNESIUM	152163.8000	147898.0800		5000	85.3		75	125	P
MANGANESE	6093.8900	5608.3500		500	97.1		75	125	P
NICKEL	588.7900	31.0100	В	500	111.6		75	125	P
POTASSIUM	41558.4200	14461.4900		25000	108.4		75	125	P
SELENIUM	2109.6200	0.2100	U	2000	105.5		75	125	P
SILVER	47.5900	-3.9200	U	50	95.2		75	125	P
SODIUM	1587538.3300	1600947.6300		7500	-178.8		75	125	P
THALLIUM	2070.8200	-0.3700	U	2000	103.5		75	125	P
VANADIUM	550.5300	-1.6200	U	500	110.1		75	125	P
ZINC	573,9200	29.1400		500	109.0		75	125	P

5A SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services Client Field ID: 22GLM0601S

Matrix: WATER SDG Name: WP4035

Percent Solids: 0.00 Lab Sample ID: WP4035-003P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Spiked		Sample		Spike	Control Limits (%R)				
Analyte	Sample Result C	Result	C	Added	%R	Q	Low	High	M
ALUMINUM	2349.6500	136.5400		2000	110.7		75	125	. P
ANTIMONY	546.4900	-1.4000	U	500	109.3		75	125	P
ARSENIC	2246.7500	6.0600	В	2000	112.0		75	125	P
BARIUM	2248.6000	65.3700		2000	109.2		75	125	P
BERYLLIUM	57.0300	0.2500	U	50	114.1		75	125	P
CADMIUM	61.1500	1.0800	υ	50	122.3		75	125	P
CALCIUM	397133.0500	397131.8300		2500	0.0		75	125	P
CHROMIUM	217.6200	-3.8000	U	200	108.8		75	125	P
COBALT	652.8700	102.4300		500	110.1		75	125	P
COPPER	272.5500	-0.9900	U	250	109.0		75	125	P
IRON	19120.2600	17767.2500		1000	135.3		75	125	P
LEAD	521.9400	1.3400	В	500	104.1		75	125	P
MAGNESIUM	155943.0800	147898.0800		5000	160.9		75	125	P
MANGANESE	6243.1600	5608.3500		500	127.0		75	125	P
NICKEL	594.4000	31.0100	В	500	112.7		75	125	P
POTASSIUM	42151.4700	14461.4900		25000	110.8		75	125	P
SELENIUM	2112.5200	0.2100	U	2000	105.6		75	125	P
SILVER	47.9100	-3.9200	U	50	95.8		75	125	P
SODIUM	1639213.8600	1600947.6300		7500	510.2		75	125	P
THALLIUM	2059.0100	-0.3700	U	2000	103.0		75	125	P
VANADIUM	555.3900	-1.6200	υ	500	111.1		75	125	P
ZINC	584.0600	29.1400		500	111.0		75	125	P

5D SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services Client Field ID: 22GLM0601

Matrix: WATER SDG Name: WP4035

Percent Solids: 0.00 Lab Sample ID: WP4035-003

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C Spike Dup. Result	C RPD	Q M
ALUMINUM		2346.3500	2349.6500	0.1	P
ANTIMONY		545.4400	546.4900	0.2	P
ARSENIC		2239,4800	2246.7500	0.3	P
BARIUM		2226.8100	2248.6000	1.0	P
BERYLLIUM		55.9100	57.0300	2.0	P
CADMIUM		59.5000	61.1500	2.7	P
CALCIUM		395830.5000	397133.0500	0.3	P
CHROMIUM		216.7400	217.6200	0.4	P
COBALT		642.8200	652.8700	1.6	P
COPPER		269.6900	272.5500	1.1	P
IRON		18672.9600	19120.2600	2.4	P
LEAD		527.4600	521.9400	1.1	P
MAGNESIUM		152163.8000	155943.0800	2.5	P
MANGANESE		6093.8900	6243.1600	2.4	P
NICKEL		588.7900	594.4000	0.9	P
POTASSIUM		41558.4200	42151.4700	1.4	P
SELENIUM		2109.6200	2112.5200	0.1	P
SILVER	15	47.5900	47.9100	0.7	P
SODIUM		1587538.3300	1639213.8600	3.2	P
THALLIUM		2070.8200	2059.0100	0.6	P
VANADIUM		550.5300	555,3900	0.9	P
ZINC		573.9200	584.0600	1.8	P

SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB020405S

Matrix: SOIL

SDG Name:

WP4035

Percent Solids: 75.5

Lab Sample ID: WP4035-011S

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

	Spiked	Sample	Spike	Control Limits (%R)			
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M
MERCURY	0.3277	0.1696	0.18	87.8	75	125	cv

5A SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB020405S

Matrix: SOIL

SDG Name: WP4035

Percent Solids: 75.5

Lab Sample ID: WP4035-011P

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

	Spiked	Sample	Spike		Control Limits (%R)		
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M
MERCURY	0.3739	0.1696	0.18	113.5	75	125	CV

5D SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB020405

Matrix: SOIL

SDG Name:

WP4035

Percent Solids: 75.5

Lab Sample ID: WP4035-011

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Control Limits	Spike Result C	Spike Dup. Result C	RPD (Q M	
MERCURY		0.3277	0.3739	13.2	CV	

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092499

Lab Name: Katahdin Analytical Services

SDG No.: WP4035

Lab File ID:

Z2167

Lab Sample ID: SBLK;092499

Instrument ID:

5972-Z

Date Extracted: 9/24/99

GC Column:

RTX-5

ID: 0.25 (mm) Date Analyzed: 09/28/99

Matrix: (soil/water) SOIL

Time Analyzed: 13:18

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	<u>Lab</u> Data File	Date Injected	Time Injected
LCS;092499	LCS;092499	Z2168	9/28/99	2:04:00 PM
36SLB020405	WP4035-11	Z2182	9/29/99	11:51:00 AM
36SLB050405	WP4035-12	Z2183	9/29/99	12:38:00 PM



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

SBLK;092499

SDG:

WP4035

Report Date:

10/7/99

PO No.:

N7912-P99264 CTO #68

Project: % Solids:

100

Method:

EPA 8270

Date Analyzed: 9/28/99

Sample Description	Matrix Sa	mpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092499	SL	•	•	9/24/99	DPD	EPA 3550	KRT
Compound	Result	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<330	ug/Kg	1.0	330	330		
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHENE	<330	ug/Kg	1.0	330	330		
FLUORENE	<330	ug/Kg	1.0	330	330		
PHENANTHRENE	<330	ug/Kg	1.0	330	330		
ANTHRACENE	<330	ug/Kg	1.0	330	330		
FLUORANTHENE	<330	ug/Kg	1.0	330	330		
PYRENE	<330	ug/Kg	1.0	330	330		
3ENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330		
CHRYSENE	<330	ug/Kg	1.0	330	330		
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO[A]PYRENE	<330	ug/Kg	1.0	330	330		
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330		
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330		
BENZO[Ġ,H,I]PERYLENE	<330	ug/Kg	1.0	330	330		
NITROBENZENE-D5	63	%	1.0				
2-FLUOROBIPHENYL	66	%	1.0				
TERPHENYL-D14	76	%	1.0				

Report Notes:

Katahdin Analytical Services 8270 LCS Recovery Sheet

Lab File: Z2168

Sample ID: LCS;092499

Date Run: 9/28/99

Analyst: SW

Time Injected: 2:04:00 PM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1150	69	60-140
ACENAPHTHENE	1667	1060	64	60-140
ACENAPHTHYLENE	1667	1200	72	60-140
ANTHRACENE	1667	1220	73	60-140
BENZO[A]ANTHRACENE	1667	1260	76	60-140
BENZO[A]PYRENE	1667	1200	72	60-140
BENZO[B]FLUORANTHENE	1667	1220	73	60-140
BENZO[G,H,I]PERYLENE	1667	1090	66	60-140
BENZO[K]FLUORANTHENE	1667	1160	70	60-140
CHRYSENE	1667	1230	74	60-140
DIBENZ[A,H]ANTHRACENE	1667	1130	68	60-140
FLUORANTHENE	1667	1340	81	60-140
FLUORENE	1667	1180	70	60-140
INDENO[1,2,3-CD]PYRENE	1667	1210	73	60-140
NAPHTHALENE	1667	1090	65	60-140
PHENANTHRENE	1667	1320	79	60-140
PYRENE	1667	1230	74	60-140

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092799

Lab Name: Katahdin Analytical Services

SDG No.: WP4035

Lab File ID:

Z2180

Lab Sample ID: SBLK;092799

Instrument ID:

5972-Z

Date Extracted: 9/27/99

GC Column: RTX-5

ID: 0.25

Date Analyzed: 09/29/99

Matrix: (soil/water) SOIL

(mm)

Time Analyzed: 10:18

Level: (low/med)

LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	<u>Lab</u> Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092799	LCS;092799	Z2181	9/29/99	11:04:00 AM
36SLB030405	WP4035-13	Z2184	9/29/99	1:25:00 PM



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

SBLK:092799

SDG:

WP4035

Report Date:

10/7/99

PO No. :

N7912-P99264

Project:

CTO #68

% Solids:

100

Method:

EPA 8270

Date Analyzed: 9/29/99

Sample Description SBLK;092799	Matrix Sampled Date SL -		Rec'd Date	9/27/99	Ext'd By DAS	Ext. Method EPA 3550	Analyst
NAPHTHALENE	<330	ug/Kg	1.0	330	330		
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHENE	<330	ug/Kg	1.0	330	330		
FLUORENE	<330	ид/Кд	1.0	330	330		
PHENANTHRENE	<330	ug/Kg	1.0	330	330		
ANTHRACENE	<330	ug/Kg	1.0	330	330		
FLUORANTHENE	<330	ug/iKg	1.0	330	330		
PYRENE	<330	ug/Kg	1.0	330	330		
BENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330		
CHRYSENE	<330	ug/Kg	1.0	330	330		
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO(A)PYRENE	<330	ug/Kg	1.0	330	330		
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330		
DIBENZ(A,H)ANTHRACENE	<330	ug/Kg	1.0	330	330		
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1.0	330	330		
NITROBENZENE-D5	70	%	1.0				
2-FLUOROBIPHENYL	72 .	%	1.0				
TERPHENYL-D14	83	%	1.0				

Report Notes:

Katahdin Analytical Services 8270 LCS Recovery Sheet

Lab File: Z2181

Sample ID: LCS;092799

Date Run: 9/29/99

Analyst: KRT

Time Injected: 11:04:00 AM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1430	86	60-140
ACENAPHTHENE	1667	1240	74	60-140
ACENAPHTHYLENE	1667	1430	86	60-140
ANTHRACENE	1667	1460	88	60-140
BENZO[A]ANTHRACENE	1667	1480	89	60-140
BENZO[A]PYRENE	1667	1410	84	60-140
BENZO[B]FLUORANTHENE	1667	1340	80	60-140
BENZO[G,H,I]PERYLENE	1667	1650	99	60-140
BENZO[K]FLUORANTHENE	1667	1460	88	60-140
CHRYSENE	1667	1440	86	60-140
DIBENZ[A,H]ANTHRACENE	1667	1680	101	60-140
FLUORANTHENE	1667	1560	94	60-140
FLUORENE	1667	1350	81	60-140
NDENO[1,2,3-CD]PYRENE	1667	1920	116	60-140
NAPHTHALENE	1667	1390	83	60-140
PHENANTHRENE	1667	1510	91	60-140
YRENE	1667	1460	88	60-140

4A **VOLATILE ORGANICS METHOD BLANK SUMMARY**

EPA SAMPLE NO.

VBLKM28A

Lab Name: Katahdin Analytical Services

SDG No.: WP4035

Lab File ID:

M2034

Lab Sample ID: VBLKM28A

Date Analyzed: 09/28/99

Time Analyzed: 13:12

GC Column: RTX-624 ID: 0.18

(mm)

Heated Purge: (Y/N) Y

Instrument ID: 5972-M

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSM28C	LCSM28C	M2033	9/28/99	12:23:00 PM
36SLB020405	WP4035-11	M2036	9/28/99	2:53:00 PM
36SLB050405	WP4035-12	M2037	9/28/99	3:34:00 PM
36SLB030405	WP4035-13	M2038	9/28/99	4:15:00 PM



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKM28A

SDG:

WP4035

Report Date: PO No. : 10/6/99

Project:

N7912-P99264

% Solids:

CTO #68 100

Method:

100

Date Analyzed: 9/28/99

SW8260

Sample Description	Matrix S	ampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst	
VBLKM28A	SL	SL -		9/28/99	HMP	5030	НМР	
Compound	Resul	t Units	DF	Sample PQL	Method PQL			
BENZENE	<5	ug/Kg	1.0	5	5			
TOLUENE	<5	ug/Kg	1.0	5	5			
1,2-DIBROMOETHANE	<5	ug/Kg	1.0	5	5			
ETHYLBENZENE	<5	ug/Kg	1.0	5	5			
NAPHTHALENE	J3	ug/Kg	1.0	5	5			
MTBE	<5	ug/Kg	1.0	5	5			
TOTAL XYLENES	<5	ug/Kg	1.0	5	5			
DIBROMOFLUOROMETHANE	122	%	1.0					
1,2-DICHLOROETHANE-D4	120	%	1.0					
TOLUENE-D8	123	%	1.0					
P-BROMOFLUOROBENZENE	120	%	1.0					

Report Notes:

J

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: M2033

Sample ID: LCSM28C

Date Run: 9/28/99

Analyst: HMP

Time Injected: 12:23:00 PM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	55.6	111	60-140
BENZENE	50	54.9	110	60-140
ETHYLBENZENE	50	56.2	112	60-140
мтве	50	55.1	110	60-140
NAPHTHALENE	50	51.8	104	60-140
TOLUENE	50	56.1	112	60-140
TOTAL XYLENES	150	166	111	60-140



SDG NARRATIVE KATAHDIN ANALYTICAL SERVICES TETRA TECH NUS CASE CNC CHARLESTON



Sample Receipt

The following samples were received on September 24 and 25, 1999 and were logged in under Katahdin Analytical Services work order number WP4075 for a hardcopy due date of October 24, 1999.

KATAHDIN	TTNUS	GEL
Sample No.	Sample Identification	Sample Identification
WP4075-1&17	27GLX0301	
WP4075-2&18	27GLX0401	
WP4075-3&19	27GLX4D01	
WP4075-4&45	28GLM0201D	
WP4075-5&20	27GLM0101D	
WP4075-6&16	27GLX0501	
WP4075-7&15	27GLM0101	
WP4075-8&44	28GLM0201	
WP4075-9&43	28GLM0301	
WP4075-10&42	27GLX0701	
WP4075-11&24	36SLB040304	9909740-08
WP4075-12&23	36SLB070304	9909740-09
WP4075-13&21	26SLB350405	9909740-10
WP4075-14&22	26SLB360405	9909740-12
WP4075-25	23SLB050203	
WP4075-26	23SLB060001	
WP4075-27	23SLB080203	
WP4075-28	23SLB010203	
WP4075-29	23SLB030203D	9909740-07
WP4075-30	23SLB040203	
WP4075-31	23SLB130203	9909740-05
WP4075-32	23SLB030203	9909740 - 06
WP4075-33	36SLB060304	9909740-11
WP4075-34	26SLB140405	
WP4075-35	42SLB090304 .	9909740-01
WP4075-36	42SLB200203	9909740-02
WP4075-37	42SLB410304	9909740-03
WP4075-38	42SLB270304	9909740-04
WP4075-39	28GLM0101	
WP4075-40	28TL00101	
WP4075-41	28TL00201	



The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Fourteen soil/sediment and thirteen aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 24, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5972-S (aqueous), 5973-U (aqueous and methanol soil), and 5972-M (low level soils) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. An aqueous matrix spike/matrix spike duplicate analysis was performed on sample WP4075-19.

Initial analysis of soil sample WP4075-23 yielded internal standard area and surrogate recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in this data package.

Initial analysis of soil sample WP4075-33 following low level protocols yielded a concentration of the target analyte naphthalene over the upper limit of the calibration curve. Analysis of the methanol-extruded aliquot also yielded a concentration of naphthalene over the upper limit of the calibration curve. A 1:5 dilution of the methanol sample was then performed successfully. All three sets of data for this sample are included in the data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.



Semivolatile Organic Analysis

Fourteen soil/sediment and eleven aqueous samples were received by Katahdin Analytical Services laboratory on September 25, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on September 29, 1999. A laboratory control spike was extracted in the batch, along with a site-specific MS/MSD pair on sample WP4075-13. Extraction of all of the aqueous samples occurred following USEPA method 3510 on September 28, 1999. A laboratory control sample was extracted in the batch.

Initial analysis of sample WP4075-14 was performed at a 1:5 dilution due to the matrix and high target analyte concentrations, resulting in elevated reporting limits. Reanalysis occurred at a 1:10 dilution to bring target analyte concentrations within the range of the calibration curve. Both sets of data are included in this data package.

Initial analysis of sample WP4075-33 yielded target analyte concentrations over the upper limit of the calibration curve. Reanalysis occurred at a 1:4 dilution successfully. Both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP4075 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Soil-matrix Katahdin Sample Nos. WP4075-(11, 12, 25-33) were digested for ICP analysis on 10/07/99 (QC Batch PJ07ICS1) in accordance with USEPA Method 3050B. Katahdin Sample No. WP4075-30 was prepared with duplicate matrix-spiked aliquots.

Aqueous-matrix Katahdin Sample Nos. WP4075-(5, 10, 15-19) were digested for ICP analysis on 10/07/99 (QC Batch PJ07ICW0) in accordance with USEPA Method 3010A.



ICP analyses of Katahdin Work Order WP4075 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Aqueous-matrix Katahdin Sample Nos. WP4075-(5, 10, 15-19) were digested for mercury analysis on 09/28/99 (QC Batch PI28HGW0) in accordance with USEPA Method 7470A.

Soil-matrix Katahdin Sample Nos. WP4075-(11, 12, 33) were digested for mercury analysis on 10/07/99 (QC Batch PJ07HGS1) in accordance with USEPA Method 7471A.

Mercury analyses of Katahdin Work Order WP4075 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) and Sulfate analyses (375.4) were performed according to the U.S. EPA, Methods for Chemical Analysis of Water and Wastes, EPA 600/4-79-020, 1979, Revised 1983. Analyses for Total Combustible Organics (TCO) have been performed in accordance with the "Annual Book of ASTM Standards", 1987. Analyses for Solids-Total Residue (TS) have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All analyses were performed within analytical hold time. No protocol deviations were noted by the Wet Chemistry laboratory staff.

			· (* ,
ATAHDIN ANALYTICAL SERVICES AMPLE RECEIPT CONDITION REP				LAB (WORK ORDER) #	WP 4075
el. (207) 874-2400	J.(.			PAGE:\	OF \$ 5
ax (207) 775-4029				202152	. o. ≥ 5
		••		COOLER:	<u></u>
LIENT: Tetratech - SC				COC# SDG#	· · · · · · · · · · · · · · · · · · ·
LIENT: Tetratech - SC				DATE / TIME RECEIVED:	09-24-99 ~0845
1				DELIVERED BY:	FOX
ROJECT: CNC CHARLESTON	10*68			RECEIVED BY: LIMS ENTRY BY:	BKR.
	-			LIMS REVIEW BY / PM:	Aoc
, t	YES	NO EXCEPT	IONS	COMMENTS	RESOLUTION
CUSTODY SEALS PRESENT / INTACT?	X				
CHAIN OF CUSTODY PRESENT IN THIS COOLER?	Þ.				
CHAIN OF CUSTODY SIGNED BY CLIENT?	[2]				
CHAIN OF CUSTODY MATCHES SAMPLES?				3.ce bolon	test not needed - will
TEMPERATURE BLANKS PRESENT?	a			TEMP BLANK TEMP (*C)=	cruss off coc.
SAMPLES RECEIVED AT 4°C 4729 1CE DICE PACKS PRESENT Y OF N?		d 0		COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP	DE VINCTIMA BLANK IS NOT PRESENT)
VOLATILES FREE OF HEADSPACE?				·	·
TRIP BLANK PRESENT IN THIS COOLER	A			·	
PROPER SAMPLE CONTAINERS AND VOLUME?	2		l		
). SAMPLES WITHIN HOLD TIME UPON RECEIPT?				·	<u> </u>
I. SAMPLES PROPERLY PRESERVED(1)?	3		l	<u> </u>	
2. CORRECTIVE ACTION REPORT FILED?		☐ N/	A.		
). ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	MERCIAL C	LP HAZWRAP	NFESC ACOE	AFCEE: OTHER (STATE OF ORIGIN):_	
LOG-IN NOTES (1): 27 GLM 0(010 -	- Ito va	t receiv	e metha-	e, anions	
286LM02010 -	did w	recau	e metha	re, arions, motos	
286LM0301 Zdie	d not or	eceine m	ite		
306LM 6201	•	``			

Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required, If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400 Fax (207) 775-4029		.,		PAGE: 2 OF 2 5 COOLER: 2 OF 2 5
PROJECT: CNC CONCLOSION/ CT	D#\0g	-		COC#SDG#DATE / TIME RECEIVED: 09-24-99~ 0845 DELIVERED BY: FGDE# RECEIVED BY: Baa LIMS ENTRY BY: BE RECEIVED
	4	_		LIMS REVIEW BY / PM: A) C.
1. CUSTODY SEALS PRESENT / INTACT? 2. CHAIN OF CUSTODY PRESENT IN THIS COOLER? 3. CHAIN OF CUSTODY SIGNED BY CLIENT? 4. CHAIN OF CUSTODY MATCHES SAMPLES? 5. TEMPERATURE BLANKS PRESENT? 6. SAMPLES RECEIVED AT 4°C 12? 1. CEPTICE PACKS PRESENT YOT N? 7. VOLATILES FREE OF HEADSPACE? 8. TRIP BLANK PRESENT IN THIS COOLER 9. PROPER SAMPLE CONTAINERS AND VOLUME? 10. SAMPLES WITHIN HOLD TIME UPON RECEIPT? 11. SAMPLES PROPERLY PRESERVED(1)? 12. CORRECTIVE ACTION REPORT FILED? 13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMITTED COMMI	YES DO BOD DO BERCIAL		EXCEPTIONS O O O O O O O O O O O O O O O O O O	TEMP BLANK TEMP (*C)=2.0 COOLER TEMP (*C)=
		٠,		

Use this s, and additional sheets if necessary) to document samples that are received broken ... compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required of adjustment record volume and type of presentables and type of presentables.

KATAHD ANALYTICAL SERVICES, SAMPLE RECEIPT CONDITION REPORTS. (207) 874-2400 Fax (207) 775-4029 CLIENT: Texaded - NUS PROJECT: CTO 68/ CNC	ORT	STOR	LAB (WORK OF PAGE:	3 OF 3 SK 5 3 OF 3 SK 5 RECEIVED: 09-25-99 BY: FEDEX BY: BKR	~10.50
1. CUSTODY SEALS PRESENT / INTACT? 2. CHAIN OF CUSTODY PRESENT IN THIS COOLER? 3. CHAIN OF CUSTODY SIGNED BY CLIENT? 4. CHAIN OF CUSTODY MATCHES SAMPLES? 5. TEMPERATURE BLANKS PRESENT? 6. SAMPLES RECEIVED AT 4°C+22 CETIZE PACKS PRESENT YON? 7. VOLATILES FREE OF HEADSPACE? 8. TRIP BLANK PRESENT IN THIS COOLER 9. PROPER SAMPLE CONTAINERS AND VOLUME? 10. SAMPLES WITHIN HOLD TIME UPON RECEIPT? 11. SAMPLES PROPERLY PRESERVED(1)? 12. CORRECTIVE ACTION REPORT FILED? 13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	YES O O O O O O O O O O O O O O O O O O O			NA IP ONLY IF TEMP BLANK IS NOT PRESENT)	
LOG - IN NOTES ⁽¹⁾ :		:	<u> </u>		

Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400 Fax (207) 775-4029		LAB (WORK ORDER) # WP 4075 PAGE: 4 OF 5 COOLER: 4 OF 5
CLIENT: Tetratech - NUS	<u>}</u>	COC#SDG#DATE / TIME RECEIVED:O9-25-99~/050DELIVERED BY: FFDFF
PROJECT: CTO 68/ CNC	HARLESTON	RECEIVED BY: LIMS ENTRY BY: LIMS REVIEW BY / PM:
	YES NO EXCEPTIONS	COMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	U TEN O	
3. CHAIN OF CUSTODY SIGNED BY CLIENT?		
4. CHAIN OF CUSTODY MATCHES SAMPLES?		see porse lof5
5. TEMPERATURE BLANKS PRESENT?		TEMP BLANK TEMP (°C)= 4.5
6. SAMPLES RECEIVED AT 4°C + 29 ICE / ICE PACKS PRESENT Y OF N?		COOLER TEMP (*C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?		
8. TRIP BLANK PRESENT IN THIS COOLER		
9. PROPER SAMPLE CONTAINERS AND VOLUME?		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?		
11. SAMPLES PROPERLY PRESERVED ⁽¹⁾ ?		•
12. CORRECTIVE ACTION REPORT FILED?	O Ø N/A	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMI	ERCIAL CLP HAZWRAP KFESC	ACOE AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES ⁽¹⁾ :		
LOG-IN NOTES .		
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)	

Use this signal additional sheets if necessary) to document samples that are received broke.

check if required. If samples required pH adjustment, record volume and type of orazervative added

compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH

KATAHDIN ANALYTICAL SERVICES,	. INC.		LAB (WORK ORDER) #	NP4075
SAMPLE RECEIPT CONDITION REPO		·		
Tel. (207) 874-2400	J. C.		PAGE:	OF Z
Fax (207) 775-4029			2	
	٠.		COOLER:	OF
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CLIENT: Tetrated NUS			COC#	
CLIENT: 1 strate M NUS	<u>></u>		SDG#	20-25-002-1/25/
:			DATE / TIME RECEIVED: DELIVERED BY:	09-25-11-1050
			RECEIVED BY:	- FIGURE
PROJECT: CTO 68 / CNC	CHARLES	701L)	LIMS ENTRY BY:	RKH
7 0700	*	•	LIMS REVIEW BY / PM:	AJC
	YES NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?				
SCHANGE CUSTODY PRECENT IN THE COOLERS		П	-	 -
2:CHAIN OF CUSTODY PRESENT IN THIS COOLER?				
3. CHAIN OF CUSTODY SIGNED BY CLIENT?		U		
4. CHAIN OF CUSTODY MATCHES SAMPLES?			see your lof 5	
The state of the s	19	_		
5. TEMPERATURE BLANKS PRESENT?		ч	TEMP BLANK TEMP (°C)=	<u> </u>
6. SAMPLES RECEIVED AT 4°C			COOLER TEMP (°C)= NA	·
ICE I JEE PACKS PRESENT Y N?	_		(RECORD COOLER TEMP ONLY IF TEMP	BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?				
		, <u> </u>		
8. TRIP BLANK PRESENT IN THIS COOLER		u		
9. PROPER SAMPLE CONTAINERS AND VOLUME?				
		П		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?			•	
11. SAMPLES PROPERLY PRESERVED(1)?		- U		
12. CORRECTIVE ACTION REPORT FILED?		N/A		
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	IERCIAL CLP HAZ	WRAP NESC A	COE AFCEE OTHER (STATE OF ORIGIN):	
LOG - IN NOTES(1):				
3				
<u> </u>		•		
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Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required, if samples required pH adjustment, record volume and type of presentation and adjustment.

Katalidin 340 County Road No. 5 P.O. Box 720 Westbrook, ME 04092

CHAIN of CUSTODY

	El: (207) 874-2400 Fax: (207) 775-4029						PLEAS	E PRIN	Γ IN PE	N	Pa	ige	of
Client TETRA TEC	H NUS		Contac	_	Higa		Phone # (850)	385	. 989	-	ax #)		
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365LB\$603\$4	9-24-99/1649	S	7500	4	1				1		1		
23 SLB040203	9-24-91/1730	5	6	4	ī	1							
265LB140405	7.24.99/0845	5	5	4	1								
425LB090304	7.24-99/1035	5	1						1				
425LB 20 0203	9.24.99/1050	5	1						1				
425LB410304	9.24.99/1120	5	1						1				
42518270304	9.24.98/1140	5								1			
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Katahdin 340 County Road No. 5 P.O. Box 720 Westbrook, ME 04098

CHAIN of CUSTODY

`	Tel: (207) 874-2400 Fax: (207) 775-4029					PLEASE PRINT IN PEN Page of								
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Aè	- 14-21. Auf	<u> </u>	City	0.0	harl.	es to	<u>~</u> s	tate 5	<u>_</u>		Zip Code	<u> </u>		
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	26 SLB 35 04 05	9/24/49/1635	5	5	X	X	X							۲
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		9/23/49/1210	5	6	X	<u> </u>	X	x_						46
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CHAIN of CUSTODY

ANAIM LICAL SULATORS Tel: (20	00k, M.E. 04092 07) 874-2400 107) 775-4029					_	PLEASE	PRINT	IN PEN	ł	Pag	je <u> </u>	of <u>1</u>
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* Sample Description	Date / Time	Matrix	No. of	SAGO EOP. A	Dissolv Methous	PAH	metals	knĵon	<u> </u> 				
	coll'd		Cntrs.				E	2	_	<u> </u>	<u> </u>		
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27GLX44\$1	J-93/1010	-		2		<u>\$</u>	1			<u> </u>			
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ORMSOURCE INC. 12 (207) 782-3311				_	_				20101				

New England-ME Laboratory (207) 874-2400 CONFIRMATION

ORDER NO WP-4075

Page 1

Project Manager: Andrea J. Colby

ORDER DATE: 09/24/99 F "ORT TO: Paul Calligan PHONE: 850/385-9899 Tetra Tech NUS FAX: 850/385-9860 1401 Oven Park Dr., Suite 102 DUE: 24 OCT Tallahassee, FL 32308 FAC. ID: CNC CHARLESTON ACCOUNTS PAYABLE INVOICE: PHONE: 412/921-7090 TETRA TECH NUS, INC. PO: N7912-P99264 FOSTER PLAZA 7, 661 ANDERSEN DR. PROJECT: CTO #68 PITTSBURGH. PA 15220 DELIVERED BY: FEDEX SAMPLED BY: CLIENT DISPOSE: AFTER 23 NOV SAMPLED DATE/TIME RECEIVED ITEM LOG NUMBER SAMPLE DESCRIPTION MATRIX WP4075-1 27GLX0301 23 SEP 1010 24 SEP ΑO 23 SEP 1010 WP4075-2 27GLX0401 23 SEP 1012 WP4075-3 27GLX4D01 WP4075-4 28GLM0201D 23 SEP DETERMINATION METHOD OTY PRICE AMOUNT EPA 8270 . 125.00 Polynuclear Aromatic Hydrocarbons 500.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4075-5 27GLM0101D 23 SEP 24 SEP AO **DETERMINATION** METHOD OTY PRICE AMOUNT Target Analyte List Metals, Total 1 100.00 100.00 Polynuclear Aromatic Hydrocarbons EPA 8270 1 125.00 125.00 TOTALS 225.00 225.00 SAMPLED DATE/TIME LOG NUMBER SAMPLE DESCRIPTION RECEIVED MATRIX 27GLX0501 23 SEP WP4075-6 24 SEP AO 23 SEP 1050 WP4075-7 27GLM0101 DETERMINATION METHOD OTY PRICE TUUOMA Polynuclear Aromatic Hydrocarbons 2 EPA 8270 125.00 250.00 2 Nitrate as N 353.2 30.00 60.00 Sulfate 2 375.4 0,00 0.00 TOTALS 155.00 310.00

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 2

ORDER NO WP-4075 Project Manager: Andrea J. Colby ORDER DATE: 09/24/99 REPORT TO: Paul Calligan PHONE: 850/385-98" FAX: 850/385-98 Tetra Tech NUS 1401 Oven Park Dr., Suite 102 DUE: 24 OCT FAC.ID: CNC CHARLESTON Tallahassee, FL 32308 ACCOUNTS PAYABLE PHONE: 412/921-7090 INVOICE: TETRA TECH NUS, INC. PO: N7912-P99264 FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220 PROJECT: CTO #68 DELIVERED BY: FEDEX SAMPLED BY: CLIENT DISPOSE: AFTER 23 NOV SAMPLED DATE/TIME RECEIVED LOG NUMBER SAMPLE DESCRIPTION MATRIX WP4075-10 27GLX0701 23 SEP 1126 24 SEP ΑQ DETERMINATION METHOD OTY PRICE AMOUNT Polynuclear Aromatic Hydrocarbons EPA 8270 1 125.00 125.00 Target Analyte List Metals, Total 1 100.00 100.00 Nitrate as N 353.2 1 30.00 30.00 Sulfate 375.4 1 0.00 0.00 TOTALS 1 255.00 255.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4075-11 36SLB040304 23 SEP 0900 24 SEP SLWP4075-12 23 SEP 1210 36SLB070304 DETERMINATION METHOD OTY PRICE TRUOMA Solids-Total Residue (TS) CLP/CIP SO 2 0.00 0.00 Target Analyte List Metals, Total 2 100.00 200.00 Polynuclear Aromatic Hydrocarbons EPA 8270 2 135.00 270.00 TPH Subcontract 2 75.00 150.00 TOTALS 2 620.00 310.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4075-13 26SLB350405 23 SEP 1635 24 SEP SL WP4075-14 26SLB360405 23 SEP 1610 DETERMINATION METHOD OTY PRICE AMOUNT Polynuclear Aromatic Hydrocarbons EPA 8270 2 135.00 270.00

CLP/CIP SO

E418.1

2

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Solids-Total Residue (TS)

TOTALS

Total Petroleum Hydrocarbons (TPH)

0.00

75.00

210.00

0.00

150.00

420.00

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 3

MATRIX

AMOUNT

75.00

25 SEP

PRICE

75.00

ORDER NO WP-4075 Project Manager: Andrea J. Colby ORDER DATE: 09/24/99 RAPORT TO: Paul Calligan PHONE: 850/385-9899 FAX: 850/385-9860 Tetra Tech NUS 1401 Oven Park Dr., Suite 102 DUE: 24 OCT Tallahassee, FL 32308 FAC. ID: CNC CHARLESTON ACCOUNTS PAYABLE PHONE: 412/921-7090 INVOICE: TETRA TECH NUS, INC. PO: N7912-P99264 FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220 PROJECT: CTO #68 SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 23 NOV LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED **MATRIX** WP4075-15 27GLM0101 23 SEP 1050 25 SEP A₀ WP4075-16 27GLX0501 23 SEP 1100 DETERMINATION_ METHOD OTY PRICE AMOUNT Volatile Organics by 8260B SW8260 2 75.00 150.00 Target Analyte List Metals, Total 2 100.00 200.00 Methane Subcontract 2 95.00 190.00 TOTALS 270.00 540.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4075-17 27GLX0301 23 SEP 1010 25 SEP ΑO WP4075-18 27GLX0401 23 SEP 1010 WP4075-19 27GLX4D01 23 SEP 1012 METHOD DETERMINATION QTY PRICE AMOUNT Volatile Organics by 8260B SW8260 3 75.00 225,00 Target Analyte List Metals, Total 100.00 300.00 3 TOTALS 175.00 525.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED

9 WP4075-20 27GLM0101D

Volatile Organics by 8260B

DETERMINATION

23 SEP

METHOD

SW8260

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 4

ORDER NO WP-4075 Project Manager: Andrea J. Colby ORDER DATE: 09/24/99 PHONE: 850/385-98 REPORT TO: Paul Calligan Tetra Tech NUS FAX: 850/385-98 1401 Oven Park Dr., Suite 102 DUE: 24 OCT Tallahassee, FL 32308 FAC. ID: CNC CHARLESTON PHONE: 412/921-7090 ACCOUNTS PAYABLE INVOICE: TETRA TECH NUS, INC. PO: N7912-P99264 FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220 PROJECT: CTO #68 DELIVERED BY: FEDEX DISPOSE: AFTER 23 NOV SAMPLED BY: CLIENT LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4075-21 26SLB350405 23 SEP 1635 25 SEP SL10 WP4075-22 26SLB360405 23 SEP 1610 METHOD PRICE DETERMINATION TRUOMA Volatile Organics by 8260B SW8260 85.00 170.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4075-23 36SLB070304 23 SEP 1210 25 SEP SL11 23 SEP 0900 WP4075-24 36SLB040304 DETERMINATION METHOD OTY PRICE TRUDOMA Volatile Organics by 8260B SW8260 2 85.00 170.C LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX 12 WP4075-25 23SLB050203 23 SEP 1620 25 SEP SLWP4075-26 23SLB060001 23 SEP 1715 DETERMINATION METHOD OTY PRICE TRUOMA Volatile Organics by 8260B 2 SW8260 85.00 170.00 Polynuclear Aromatic Hydrocarbons EPA 8270 2 135.00 270.00 2 Lead, Total 6010 20.00 40.00 Solids-Total Residue (TS) CLP/CIP SO 2 0.00 0.00 TOTALS 240.00 480.00

ORDER NO WP-4075

Project Manager: Andrea J. Colby

SAMPLED DATE/TIME RECEIVED MATRIX

ORDER DATE: 09/24/99

REPORT TO: Paul Calligan

PHONE: 850/385-9899

Tetra Tech NUS

FAX: 850/385-9860

1401 Oven Park Dr., Suite 102 Tallahassee, FL 32308

DUE: 24 OCT FAC.ID: CNC CHARLESTON

INVOICE:

ACCOUNTS PAYABLE

PHONE: 412/921-7090

TETRA TECH NUS, INC.

PO: N7912-P99264

FOSTER PLAZA 7, 661 ANDERSEN DR.

LOG NUMBER SAMPLE DESCRIPTION

PITTSBURGH, PA 15220

PROJECT: CTO #68

SAMPLED BY: CLIENT

DELIVERED BY: FEDEX

DISPOSE: AFTER 23 NOV

DOG NOTED BY DECERT 1 1011			<u> </u>	1.12.7.1.1.19
WP4075-27 23SLB080203	24 SEP	0900	25 SEP	SL
WP4075-28 23SLB010203	24 SEP	0925		
WP4075-30 23SLB040203	24 SEP	1730		
DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	85.00	255.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	135.00	405.00
Lead, Total	6010	3	20.00	60.00
Solids-Total Residue (TS)	CLP/CIP SO	3	0.00	0.00
TOTALS		3	240.00	720.00

LOG NUMBER SAMPLE DESCRIPTION	SAMPLED DATE	/TIME	RECEIVED	<u>MATRIX</u>
WP4075-31 23SLB130203	24 SEP		25 SEP	SL
DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	85.00	85.00
Lead, Total	6010	1	20.00	20.00
TOC Subcontract		1	60.00	60.00
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
Total Combustible Organics	ASTM D2974	1	30.00	30.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
TOTALS		1	330.00	330.00

ORDER NO WP-4075 Project Manager: Andrea J. Colby

ORDER DATE: 09/24/99 PHONE: 850/385-989

REPORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

FAX: 850/385-98

DŪE: 24 OCI

PHONE: 412/921-7090 PO: N7912-P99264

FAC.ID: CNC CHARLESTON

INVOICE: ACCOUNTS PAYABLE

TETRA TECH NUS, INC.

TETRA TECH NUS, INC.

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220

PROJECT: CTO #68

SAMPLED BY: CLIENT

TOTALS

DELIVERED BY: FEDEX

DISPOSE: AFTER 23 NOV

	LOG NUMBER SAMPLE DESCRIPTION	SAMPLED DATE	/TIME	RECEIVED	MATRIX
15	WP4075-32 23SLB030203	24 SEP	1110	25 SEP	SL
	DEMEDIATION	MERILOD	OTT	DDIGE	A MOTINITI
	<u>DETERMINATION</u>	<u>METHOD</u>	OTY	PRICE	AMOUNT
	Volatile Organics by 8260B	SW8260	1	85.00	85.00
	Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
	Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
	Lead, Total	6010	1	20.00	20.00
•	Grain Size Subcontract		1	110.00	110.00
	TPH Subcontract		1	75.00	75.00
	TOTALS		1	425.00	425.00
	LOG NUMBER SAMPLE DESCRIPTION	SAMPLED DATE	/TIME	RECEIVED	MATF
16	WP4075-33 36SLB060304	24 SEP		25 SEP	
	DETERMINATION	METHOD	OTY	PRICE	AMOUNT
	Volatile Organics by 8260B	SW8260	1	85.00	85.00
	Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
	Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
	Target Analyte List Metals, Total		1	100.00	100.00
	Grain Size Subcontract		1	110.00	110.00
	TPH Subcontract		1	75.00	75.00
			_	, , , , , ,	, , , , , ,

17	WP4075-34 26SLB140405	24 SEP	0845	25 SEF	SL
	DETERMINATION	METHOD	OTY	PRICE	AMOUNT
	Volatile Organics by 8260B	SW8260	1	85.00	85.00
	Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00
	Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00
	TOTALS		1	220.00	220.00

LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX

LABORATORY ORDER CONTINUED ON PAGE 7

505.00

505.00

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 7

ORDER NO WP-4075 Project Manager: Andrea J. Colby ORDER DATE: 09/24/99 RP RT TO: Paul Calligan PHONE: 850/385-9899 Tetra Tech NUS FAX: 850/385-9860 1401 Oven Park Dr., Suite 102 DUE: 24 OCT Tallahassee, FL 32308 FAC. ID: CNC CHARLESTON ACCOUNTS PAYABLE PHONE: 412/921-7090 INVOICE: TETRA TECH NUS, INC. PO: N7912-P99264 FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220 PROJECT: CTO #68 SAMPLED BY: CLIENT DELIVERED BY: FEDEX DISPOSE: AFTER 23 NOV SAMPLED DATE/TIME RECEIVED LOG NUMBER SAMPLE DESCRIPTION MATRIX WP4075-35 42SLB090304 24 SEP 1035 25 SEP SL18 WP4075-36 42SLB200203 24 SEP 1050 24 SEP 1130 WP4075-37 42SLB410304 METHOD OTY DETERMINATION PRICE AMOUNT Grain Size Subcontract 3 110.00 330.00 TPH Subcontract 3 75.00 225.00 TOTALS 185.00 555.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX 19 WP4075-38 42SLB270304 SL 24 SEP 1140 25 SEP TO DETERMINATION METHOD PRICE AMOUNT Total Combustible Organics ASTM D2974 1 30.00 30.00 TOC Subcontract 1 60.00 60.00 TOTALS 1 90.00 90.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED 20 WP4075-39 28GLM0101 24 SEP 0840 25 SEP ΑO DETERMINATION METHOD OTY PRICE **AMOUNT** Volatile Organics by 8260B SW8260 75.00 1 75.00 Polynuclear Aromatic Hydrocarbons EPA 8270 1 125.00 125.00 353.2 Nitrate as N 1 30.00 30.00 Sulfate 375.4 1 0.00 0.00 Methane Subcontract 1 95.00 95.00

TOTALS

325.00

325.00

VALVEDTE VENETITION DIVITORS New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 8

Project Manager: Andrea J. Colby ORDER NO WP-4075

ORDER DATE: 09/24/99 PHONE: 850/385-98

REPORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

DUE: 24 OCT

FAX: 850/385-98 FAC.ID: CNC CHARLESTON

PHONE: 412/921-7090

PO: N7912-P99264

INVOICE: ACCOUNTS PAYABLE

TETRA TECH NUS, INC.

FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220

PROJECT: CTO #68

SAMPLED BY: CLIENT

DELIVERED BY: FEDEX

DISPOSE: AFTER 23 NOV

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	<u>MATRIX</u>
21	WP4075-40	28TL00101	23 SEP	25 SEP	AQ
	WP4075-41	28TL00201	24 SEP		

DETERMINATION		<u>METHOD</u>	OTY	PRICE	AMOUNT
Volatile Organics by	8260B	SW8260	2	75.00	150.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIL	ME RECEIVED	MATRIX
22	WP4075-42	27GLX0701	23 SEP 11:	26 25 SE P	AQ
	WP4075-43	28GLM0301	23 SEP 16	1 5	
	WP4075-44	28GLM0201	23 SEP 164	10	

<u>DETERMINATION</u>	METHOD	OTY	PRICE	<u> UOMA</u>
Methane Subcontract		3	95.00	285.U.
Volatile Organics by 8260B	SW8260	3	75.00	225.00
TOTALS		3	170.00	510.00

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
23	WP4075-45	28GLM0201D	23 SEP	25 SEP	AQ

DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00

KATAMUIN ANALITICAL BERVICES, INCORPORTIES New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 9

ORDER NO WP-4075 Project Manager: Andrea J. Colby

ORDER DATE: 09/24/99

PO: N7912-P99264

METHOD OTY PRICE AMOUNT

REPORT TO: Paul Calligan

DETERMINATION

INVOICE:

PHONE: 850/385-9899 FAX: 850/385-9860 Tetra Tech NUS

1401 Oven Park Dr., Suite 102 DUE: 24 OCT FAC.ID: CNC CHARLESTON

Tallahassee, FL 32308

ACCOUNTS PAYABLE PHONE: 412/921-7090

TETRA TECH NUS, INC. FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220 PROJECT: CTO #68

DELIVERED BY: FEDEX DISPOSE: AFTER 23 NOV SAMPLED BY: CLIENT

LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX 23 SEP 1640 WP4075-8 28GLM0201 24 SEP AO 24 23 SEP 1645 WP4075-9 28GLM0301

METHOD OTY PRICE DETERMINATION TRUOMA Polynuclear Aromatic Hydrocarbons EPA 8270 2 125.00 250.00 Nitrate as N 353.2 2 30.00 60.00 Sulfate 375.4 2 0.00 0.00 TOTALS 155.00 310.00

LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX 25 WP4075-29 23SLB030203D 24 SEP 0000 25 SEP

Volatile Organics by 8260B	SW8260	1	85.00	85.00	
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	135.00	135.00	
Lead, Total	6010	1	20.00	20.00	
Solids-Total Residue (TS)	CLP/CIP SO	1	0.00	0.00	
TPH Subcontract		1	75.00	75.00	
TOTALS		1	315.00	315.00	

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 10

ORDER NO WP-4075 Project Manager: Andrea J. Colby

ORDER DATE: 09/24/99 PHONE: 850/385-9890

REPORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

FAX: 850/385-98 DUE: 24 OC:

FAC.ID: CNC CHARLESTON

INVOICE: ACCOUNTS PAYABLE

TETRA TECH NUS, INC.

PHONE: 412/921-7090 PO: N7912-P99264

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220

PROJECT: CTO #68

SAMPLED BY: CLIENT

DELIVERED BY: FEDEX

DISPOSE: AFTER 23 NOV

ORDER NOTE: QC-II+ W/NARRATIVE

DD (KAS007QC-DB3)

CNC CHARLESTON

REPORT COPY: MS. LEE LECK

TETRATECH NUS FOSTER PLAZA 7 661 ANDERSEN DR. PITTSBURGH, PA 15220 REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT

\$8,820.00

This is NOT an Invo

AJC/BKR/WEST.AJC(dw)

09-29Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note	Note Text
\$	'\$' flag denotes surrogate compound recovery is out of criteria. Re-extraction or re-analysis confirmed matrix interference.
Е	'E' flag indicates an estimated value. The analyte was detected in the sample at e concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
0-13	. Internal standard area(s) are out of criteria. Reanalysis confirmedmetrix interference.
0-2	Semple dilution required for quantitation of one or more target analytes; therefore, standard laboratory Prectical Quantitation Level (PQL) could not be achieved.



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
E	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
0-1	Sample dilution required due to matrix interference, sample viscosity or other matrix-related problem; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.
0-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

I INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB060304

WP4075

Matrix: SOIL

SDG Name:

Percent Solids: 76.6

Lab Sample ID: WP4075-033

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	5260			P	1
7440-36-0	ANTIMONY	0.18	U		P	1
7440-38-2	ARSENIC	4.3			P	1
7440-39-3	BARIUM	8.6			P	1
7440-41-7	BERYLLIUM	0.42	В		P	1
7440-43-9	CADMIUM	0.19	U		P	1
7440-70-2	CALCIUM	103000			P	5
7440-47-3	CHROMIUM	24.7			P	1
7440-48-4	COBALT	1.4	В		P	1
7440-50-8	COPPER	5.3			P	ī
7439-89-6	IRON	5950			P	l
7439-92-1	LEAD	3.9		N	P	1
7439-95-4	MAGNESIUM	2870			P	1
7439-96-5	MANGANESE	48.1			P	1
7439-97-6	MERCURY	0.02	В		CV	1
7440-02-0	NICKEL	8.2			P	1
7440-09-7	POTASSIUM	771			P	1
7782-49-2	SELENIUM	0.44	В		P	1
7440-22-4	SILVER	0.25	U		P	1
7440-23-5	SODIUM	594			P	1
7440-28-0	THALLIUM	0.44	U		P	1
7440-62-2	VANADIUM	15.6			P	1
7440-66-6	ZINC	26.0			P	1

Comments:



CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number : WP-4075-33 Report Date: 10/27/99

PO No. : N7912-P99264

Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 15 of 21

SAMPLE DESCRIPTION		MATRIX		SAMPL	ED BY	SAMPLED 1	DATE	RECEIVED
36SLB060304		Solid		CLIEN	г	09/24/	99	09/25/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	77.	wt %	1.0	0.10	CLP/CIP	SOW 10/02/99	DA	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 10/01/99 by BAD

10/27/99

LJO/baeajc(dw)/msm PJ01TSS0

CC: MS. LEE LECK TETRATECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



∘ ="ent:

Paul Calligan

Tetra Tech NUS 1401 Öven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-33

SDG:

WP4075

Report Date:

10/9/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

76

Method:

EPA 8270

Date Analyzed: 10/1/99

Sample Description	Matrix Sa	mpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB060304	SL	9/24/99	9/25/99	9/29/99	DPD	SW3550	KRT
				Sample	Method		
Compound	Result	Units	DF	PQL	PQL		
NAPHTHALENE	E26000	ug/Kg	1.3	430	330		
2-METHYLNAPHTHALENE	1300	ug/Kg	1.3	430	330		
ACENAPHTHYLENE	<430	ug/Kg	1.3	430	330		
ACENAPHTHENE	<430	ug/Kg	1.3	430	330		
FLUORENE	<430	ug/Kg	1.3	430	330		
PHENANTHRENE	<430	ug/Kg	1.3	430	330		
ANTHRACENE	<430	ug/Kg	1.3	430	330		
FLUORANTHENE	<430	ug/Kg	1.3	430	330		
'RENE	<430	ug/Kg	1.3	430	330		
	<430	ug/Kg	1.3	430	330		
CHRYSENE	<430	ug/Kg	1.3	430	330		
BENZO[B]FLUORANTHENE	<430	ug/Kg	1.3	430	330		
BENZO[K]FLUORANTHENE	<430	ug/Kg	1.3	430	330		
BENZO[A]PYRENE	<430	ug/Kg	1.3	430	330		
INDENO[1,2,3-CD]PYRENE	<430	ug/Kg	1.3	430	330		
DIBENZ[A,H]ANTHRACENE	<430	ug/Kg	1.3	430	330		,
BENZO[G,H,I]PERYLENE	<430	ug/Kg	1.3	430	330		
NITROBENZENE-D5	95	%	1.3				
2-FLUOROBIPHENYL	98	96	1.3				
TERPHENYL-D14	112	%	1.3				

ੋਨਵport Notes:

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Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-33DL

SDG:

WP4075

Report Date:

10/9/99

PO No.:

N7912-P99264 CTO #68

Project: % Solids:

76

Method:

EPA 8270

Date Analyzed: 10/4/99

Sample Description	Matrix	Sam	pled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB060304	SL	9/	/24/99	9/25/99	9/29/99	DPD	SW3550	KRT
Compound	R	esult	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	20	0000	ug/Kg	5.2	1700	330		
2-METHYLNAPHTHALENE	J.	1000	ug/Kg	5.2	1700	330		
ACENAPHTHYLENE	<	1700	ug/Kg	5.2	1700	330		
ACENAPHTHENE	<	1700	ug/Kg	5.2	1700	330		
FLUORENE	<	1700	ug/Kg	5.2	1700	330		
PHENANTHRENE	<	1700	ug/Kg	5.2	1700	330		
ANTHRACENE	<	1700	ug/Kg	5.2	1700	330		
FLUORANTHENE	<	1700	ug/Kg	5.2	1700	330		
PYRENE	<	1700	ug/Kg	5.2	1700	330		
BENZO[A]ANTHRACENE	<	1700	ug/Kg	5.2	1700	330		
CHRYSENE	<	700	ug/Kg	5.2	1700	330		
BENZO[B]FLUORANTHENE	<	700	ug/Kg	5.2	1700	330		
BENZOJKJFLUORANTHENE	<	1700	ug/Kg	5.2	1700	330		
BENZO(A)PYRENE	<	1700	ug/Kg	5.2	1700	330		
INDENO[1,2,3-CD]PYRENE	<	1700	ug/Kg	5.2	1700	330		
DIBENZ[A,H]ANTHRACENE	<	1700	ug/Kg	5.2	1700	330		
BENZO[G ,H,I]PERYLENE	<	1700	ug/Kg	5.2	1700	330		
NITROBENZENE-D5		77	%	5.2				
2-FLUOROBIPHENYL		88	%	5.2				
TERPHENYL-D14		94	%	5.2				

Report Notes:

J, O-2



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-33

SDG:

WP4075

Report Date:

10/15/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

76

Method:

SW8260

Date Analyzed: 9/30/99

Sample Description	Matrix	Samp	led Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB060304	SL	9/	24/99	9/25/99	9/30/99	КМС	5030	КМС
Compound	Re	sult	Units	DF	Sample PQL	Method PQL		_
BENZENE		<7	ug/Kg	1.4	7	5		
TOLUENE		45	ug/Kg	1.4	7	5		
1,2-DIBROMOETHANE	•	<7	ug/Kg	1.4	7	5		
ETHYLBENZENE	;	37	ug/Kg	1.4	7	5		
NAPHTHALENE	E8	800	ug/Kg	1.4	7	5		
мтве		<7	ug/Kg	1.4	7	5		
TOTAL XYLENES	2	270	ug/Kg	1.4	7	5		
DIBROMOFLUOROMETHANE	1	10	%	1.4				
1,2-DICHLOROETHANE-D4	!	97	%	1.4				
LUENE-D8	1	10	%	1.4				
∠BROMOFLUOROBENZENE	9	98	%	1.4				

≱port Notes:

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Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-33DL1

SDG:

WP4075

Report Date:

10/15/99

PO No.;

N7912-P99264

Project:

CTO #68

% Solids:

76

Method:

SW8260

Date Analyzed: 10/2/99

Sample Description	Matrix	Samp	led Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB060304	SL	9/2	24/99	9/25/99	10/2/99	НМР	5030	НМР
Compound	R	esult	Units	DF	Sample PQL	Method PQL	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
BENZENE	<	:330	ug/Kgdrywt	66	330	5		
TOLUENE	J	1180	ug/Kgdrywt	66	330	5		
1,2-DIBROMOETHANE	<	:330	ug/Kgdrywt	66	330	5		
ETHYLBENZENE	J	180	ug/Kgdrywt	66	330	5		
NAPHTHALENE	E3	38000	ug/Kgdrywt	66	330	5		
MTBE	<	330	ug/Kgdrywt	66	330	5		
TOTAL XYLENES	1	400	ug/Kgdrywt	66	330	5		
DIBROMOFLUOROMETHANE		103	%	66				
1,2-DICHLOROETHANE-D4	•	102	%	66				
FOLUENE-D8		103	%	66				
P-BROMOFLUOROBENZENE		119	%	66				

Report Notes:

J, E, O-2



ે'ient:

Paul Calligan

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Suite 102

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Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-33DL2

SDG:

WP4075

Report Date:

10/15/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

76

Method:

SW8260

Date Analyzed: 10/4/99

Sample Description	Matrix S	ampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB060304	SL	9/24/99	9/25/99	10/4/99	КМС	5030	KMC
Compound	Resu	t Units	DF	Sample PQL	Method PQL		
BENZENE	<1600	ug/Kgdrywt	330	1600	5		
TOLUENE	<1600	ug/Kgdrywt	330	1600	5		
1,2-DIBROMOETHANE	<1600	ug/Kgdrywt	330	1600	5		
ETHYLBENZENE	<1600	ug/Kgdrywt	330	1600	5		
NAPHTHALENE	47000	ug/Kgdrywt	330	1600	5		
MTBE	<1600) ug/Kgdrywt	330	1600	5		
TOTAL XYLENES	J950	ug/Kgdrywt	330	1600	5		
DIBROMOFLUOROMETHANE	94	%	330				
2-DICHLOROETHANE-D4	82	%	330				
)LUENE-D8	99	%	330				
F-BROMOFLUOROBENZENE	105	%	330				

*** Report Notes:

J, O-2

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB040304

Matrix: SOIL

SDG Name:

WP4075

Percent Solids: 84.9

Lab Sample 1D: WP4075-011

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF	
7429-90-5	ALUMINUM	7330			P	1	
7440-36-0	ANTIMONY	0.30	В		P	1	
7440-38-2	ARSENIC	3.0			P	1	
7440-39-3	BARIUM	23.9			P	1	
7440-41-7	BERYLLTUM	0.30	В		P	1	
7440-43-9	CADMIUM	0.76	В		P	I	
7440-70-2	CALCIUM	51000			P	5	
7440-47-3	CHROMIUM	24.8			P	1	
7440-48-4	COBALT	3.6			P	1	
7440-50-8	COPPER	66.0			P	1	
7439-89-6	IRON	5470			P	1	
7439-92-1	LEAD	78.9		N	P	1	
7439-95-4	MAGNESIUM	1270			P	1	
7439-96-5	MANGANESE	88.8			P	ì	
7439-97-6	MERCURY	0.04			CV	1	
7440-02-0	NICKEL	17.0			P	1	
7440-09-7	POTASSIUM	612			P	1	
7782-49-2	SELENIUM	0.24	U		P	I	
7440-22-4	SILVER	0.23	U		P	I	
7440-23-5	SODIUM	144			P	1	
7440-28-0	THALLIUM	0.41	U		P	1	
7440-62-2	VANADIUM	18.9			P	I	
7440-66-6	ZINC	157			P	5	

Comments:



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1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number: WP-4075-11

Report Date: 10/27/99 PO No. : N7912-P9

PO No. : N7912-P99264 Project : CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 4 of 21

SAMPLE DESCRIPTION		MATRIX		SAMPLI	ED BA	SAMPLED D	ATE	RECEIVED
36SIB040304		Solid		CLIEN	r	09/23/9	9	09/24/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	83.	wt &	1.0	0.10	CTb/CIb	SOW 10/02/99	DΆ	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 10/01/99 by BAD

10/27/99

LJO/baeajc(dw)/msm PJ01TSS0 CC: MS. LEE LECK TETRATECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



Client:

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Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-11

SDG:

WP4075 10/9/99

Report Date:

N7912-P99264

PO No. :

CTO #68

Project: % Solids:

85

Method:

EPA 8270

Date Analyzed: 10/1/99

Sample Description	Matrix	Samp	led Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB040304	SL	9/2	23/99	9/24/99	9/29/99	DPD	SW3550	KRT
Compound	Re	suit	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<-	400	ug/Kg	1.2	400	330		
2-METHYLNAPHTHALENE	₹.	400	ug/Kg	1.2	400	330		
ACENAPHTHYLENE	<.	400	ug/Kg	1.2	400	330		
ACENAPHTHENE	<.	400	ug/Kg	1.2	400	330		
FLUORENE	<.	400	ug/Kg	1.2	400	330		
PHENANTHRENE	<	400	ug/Kg	1.2	400	330		
ANTHRACENE	<-	400	ug/Kg	1.2	400	330		
FLUORANTHENE	<	4 0 0	ug/Kg	1.2	400	330		
PYRENE	<-	400	ug/Kg	1.2	400	330		
BENZO[A]ANTHRACENE	<-	400	ug/Kg	1.2	400	330		
CHRYSENE	<	400	ug/Kg	1.2	400	330		
BENZO[B]FLUORANTHENE	<	400	ug/Kg	1.2	400	330		
BENZO(K)FLUORANTHENE	•	400	ug/Kg	1.2	400	330		
BENZO[A]PYRENE	<.	400	ug/Kg	1.2	400	330		
INDENO[1,2,3-CD]PYRENE	<	400	ug/Kg	1.2	400	330		
DIBENZ[A,H]ANTHRACENE	<.	400	ug/Kg	1.2	400	330		
BENZO[G,H,I]PERYLENE	<	400	ug/Kg	1.2	400	330		
NITROBENZENE-D5		88	%	1.2				
2-FLUOROBIPHENYL	9	92	%	1.2				
TERPHENYL-D14	9	97	%	1.2				

Report Notes:



"lient:

Paul Calligan

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Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-24

SDG:

WP4075

Report Date: PO No.:

10/15/99

N7912-P99264

Project:

CTO #68

% Solids:

SW8260

Method: Date Analyzed:

9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB040304	SL	9/23/99	9/25/99	9/29/99	JSS	5030	JSS
Compound	Res	ult Units	DF	Sample PQL	Method PQL		
BENZENE	<6	i ug/K g	1.1	6	5		
TOLUENE	<€	ug/Kg	1.1	6.	5		
1,2-DIBROMOETHANE	<6	і цд/Кд	1.1	6	5		
ETHYLBENZENE	<6	i ug/Kg	1.1	6	5		
NAPHTHALENE	<6	ug/Kg	1.1	6	5		
MTBE	<€	i ug/Kg	1,1	6	5		
TOTAL XYLENES	<€	ug/Kg	1.1	6	5		
DIBROMOFLUOROMETHANE	10	5 %	1.1				
2-DICHLOROETHANE-D4	103	3 %	1.1				
OLUENE-D8	93	%	1.1				
P-BROMOFLUOROBENZENE	78	%	1.1				

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services Client Field ID: 36SLB070304

Matrix: SOIL SDG Name: WP4075

Percent Solids: 74.2 Lab Sample ID: WP4075-012

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	15000			P	1
7440-36-0	ANTIMONY	0.17	U		P	1
7440-38-2	ARSENIC	5.6			P	1
7440-39-3	BARIUM	48.1			P	1
7440-41-7	BERYLLIUM	0.57			P	1
7440-43-9	CADMIUM	0.18	U		P	1
7440-70-2	CALCIUM	50200			P	5
7440-47-3	CHROMIUM	31.1			P	1
7440-48-4	COBALT	2.8			P	1
7440-50-8	COPPER	5.6			P	1
7439-89-6	IRON	14100			P	1
7439-92-1	LEAD	9.7		N	P	1
7439-95-4	MAGNESIUM	2630			P	1
7439-96-5	MANGANESE	66.1			P	1
7439-97-6	MERCURY	0.03	В		CV	1
7440-02-0	NICKEL	11.3			P	1
7440-09-7	POTASSIUM	1100			P	1
7782-49-2	SELENIUM	0.74	В		P	1
7440-22-4	SILVER	0.24	U		P	1
7440-23-5	SODIUM	269			P	1
7440-28-0	THALLIUM	0.43	U		P	1
7440-62-2	VANADIUM	26.0			P	1
7440-66-6	ZINC	111			P	5



Tetra Tech NUS

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Tallahassee, FL 32308

Lab Number: WP-4075-12

Report Date: 10/27/99

PO No.

: N7912-P99264

Project

: CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 5 of 21

SAMPLE DESCRIPTION		MATRIX		SAMPL	ED BY	SAMPLED 1	ETAC	RECEIVED
36SLB070304		Solid		CLIEN	T	09/23/	99	09/24/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BX	NOTES
Solids-Total Residue (TS)	74.	wt &	1.0	0.10	CLP/CIP	SOW 10/02/99	DA	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 10/01/99 by BAD

10/27/99

LJO/baeajc(dw)/msm RJ01TSS0

CC: MS. LEE LECK TETRATECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



Client:

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Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-12

SDG:

WP4075 10/9/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

74

Method:

EPA 8270

Date Analyzed: 10/1/99

Sample Description	Matrix	Samp	oled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB070304	SL	9/	23/99	9/24/99	9/29/99	DPD	SW3550	KRT
Compound	Re	esult	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<	430	ug/Kg	1.3	430	330		
2-METHYLNAPHTHALENE	•	430	ug/Kg	1.3	430	330		
ACENAPHTHYLENE	<	430	ug/Kg	1.3	430	330		
ACENAPHTHENE	<	430	ug/Kg	· 1.3	430	330		
FLUORENE	<	430	ug/Kg	1.3	430	330		
PHENANTHRENE	•	430	ug/Kg	1.3	430	330		
ANTHRACENE	<	430	ug/Kg	1.3	430	330		
FLUORANTHENE	<	430	ug/Kg	1.3	430	330		
PYRENE	<	430	ug/Kg	1.3	430	330		
BENZOJAJANTHRACENE	<	430	ug/Kg	1.3	430	330		
CHRYSENE	<	430	ug/Kg	1.3	430	330		
BENZO[B]FLUORANTHENE	<	430	ug/Kg	1.3	430	330		
BENZO[K]FLUORANTHENE	<	430	ug/Kg	1.3	430	330		
BENZO[A]PYRENE	<	430	ug/Kg	1.3	430	330		
INDENO[1,2,3-CD]PYRENE	<	430	ug/Kg	1.3	430	330		
DIBENZ[A,H]ANTHRACENE	<	430	ug/Kg	1.3	430	330		
BENZO[G,H,I]PERYLENE	<	430	ug/Kg	1.3	430	330		
NITROBENZENE-D5	:	95	%	1.3				
2-FLUOROBIPHENYL	!	97 .	%	1.3				
TERPHENYL-D14	1	109	%	1.3				

Report Notes:



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Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-23

SDG:

WP4075 10/15/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

Method:

SW8260

Date Analyzed: 9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB070304	SL	9/23/99	9/25/99	9/29/99	J8 \$	5030	JSS
Compound	Res	sult Units	DF	Sample PQL	Method PQL		_
BENZENE	<	6 ug/Kg	1.2	6	5		
TOLUENE	<	6 ug/Kg	1.2	6	5		
1,2-DIBROMOETHANE	<	6 ug/Kg	1.2	6	5		
ETHYLBENZENE	<	6 ug/Kg	1.2	6	5		
NAPHTHALENE	<	6 ug/Kg	1.2	6	5		
MTBE	<	6 ug/Kg	1.2	6	5		
TOTAL XYLENES	<	6 ug/Kg	1.2	6	5		
DIBROMOFLUOROMETHANE	\$1		1.2				
1,2-D!CHLOROETHANE-D4	\$2	41 %	1.2				
OLUENE-D8	8	8 %	1.2				
P-BROMOFLUOROBENZENE	12	23 %	1.2				

teport Notes:

\$, O-13



Client:

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Proj. ID: CNC CHARLESTON

Lab Number:

WP4075-23RA

SDG:

WP4075

Report Date:

10/15/99

PO No.:

N7912-P99264 CTO#68

Project: % Solids:

Method:

SW8260

Date Analyzed:

9/30/99

Sample Description	Matrix	Sampl	ed Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB070304	SL	9/2	3/99	9/25/99	9/30/99	КМС	5030	КМС
Compound	Re	suit	Units	DF	Sample PQL	Method PQL		
BENZENE		8	ug/Kg	1.4	7	5		
TOLUENE		7	ug/Kg	1.4	7	5		
1,2-DIBROMOETHANE	•	47	ug/Kg	1.4	7	5		
ETHYLBENZENE		J 4	ug/Kg	1.4	7	5		
NAPHTHALENE	1	17	ug/Kg	1.4	7	5		
MTBE		¢7	ug/Kg	1.4	7	5		
TOTAL XYLENES		J 6	ug/Kg	1.4	7	5		
DIBROMOFLUOROMETHANE	\$2	227	%	1.4				
1,2-DICHLOROETHANE-D4	\$3	376	%	1.4				
TOLUENE-D8	9	97	%	1.4				
P-BROMOFLUOROBENZENE	\$2	273	%	1.4				

Report Notes:

J, \$, O-13

Lab Name: Katahdin Analytical Services

Sample ID: PBSPJ07HGS1

Matrix: SOIL

SDG Name: WP4075

QC Batch ID: PJ07HGS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	RESULT	C	
MERCURY	0.010	U	

Lab Name: Katahdin Analytical Services Sample ID: PBSPJ07ICS1

Matrix: SOIL SDG Name: WP4075

QC Batch ID: PJ07ICS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	RESULT	С	
ALUMINUM	1.080	U	
ANTIMONY	0.180	U	
ARSENIC	-0.285	В	
BARIUM	0.050	U	
BERYLLIUM	0.030	U	
CADMIUM	-0.260	В	
CALCIUM	1.470	U	
CHROMIUM	0.430	U	
COBALT	0.450	U	
COPPER	0.160	U	
IRON	0.823	В	
LEAD	0.142	В	
MAGNESIUM	1.720	U	
MANGANESE	0.100	U	
NICKEL	1.320	U	
POTASSIUM	44.950	U	
SELENIUM	0.260	U	
SILVER	0.250	U	
SODIUM	4.096	В	
THALLIUM	0.450	U	
VANADIUM	-0.371	В	
ZINC	0.172	В	

Lab Name: Katahdin Analytical Services

Sample ID: PBWP128HGW0

Matrix: WATER

SDG Name: WP4075

QC Batch ID: PI28HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	RESULT	C	
MERCURY	-0.067	В	

Lab Name: Katahdin Analytical Services Sample ID: PBWPJ07ICW0

Matrix: WATER SDG Name: WP4075

QC Batch ID: PJ07ICW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

ALUMINUM ANTIMONY ARSENIC BARIUM BERYLLIUM	10.760 1.860 2.070 0.480 0.330 -2.310	U B U U	
ARSENIC BARIUM	2.070 0.480 0.330	บ บ บ	
BARIUM	0.480 0.330	U U	
	0.330	U	
BERYLLIUM		_	
	-2.310		
CADMIUM		В	
CALCIUM	16.120	В	
CHROMIUM	4.310	U	
COBALT	4.450	U	
COPPER	1.620	U	
IRON	6.410	В	
LEAD	1.090	U	
MAGNESIUM	17.160	U	
MANGANESE	0.970	U	
NICKEL	13.210	U	
POTASSIUM	449.540	U	
SELENIUM	2.570	U	
SILVER	2.540	U	
SODIUM	53.390	В	
THALLIUM	4.490	U	
VANADIUM	3.580	υ	
ZINC	7.640	В	

/

LABORATORY CONTROL SAMPLES

Lab Name: Katabdin Analytical Services

Sample ID: LCSSPJ07HGS1

Matrix: SOIL

SDG Name: WP4075

QC Batch ID: PJ07HGS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	TRUE	FOUND	% R	LIMITS (%)
MERCURY	1.8	2.32	128.9	54 146

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services

Sample ID: LCSSPJ07ICS1

Matrix: SOIL

SDG Name: WP4075

QC Batch ID: PJ071CS1

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	TRUE	FOUND	% R	LIMIT	S (%)
ALUMINUM	5720.0	5905,25	103.2	66	134
ANTIMONY	26.6	27.06	101.7	13	186
ARSENIC	163.0	162.00	99.4	62	138
BARIUM	195.0	182.06	93.4	66	134
BERYLLIUM	78.9	76.37	96.8	7 2	128
CADMIUM	114.0	101.16	88.7	74	124
CALCIUM	1280.0	1175.24	91.8	70	130
CHROMIUM	175.0	165.58	94.6	69	131
COBALT	73.7	66.65	90.4	70	130
COPPER	91.0	85.91	94.4	71	128
IRON	9080.0	9812.05	108.1	53	146
LEAD	66.0	70.36	106.6	68	132
MAGNESIUM	1210.0	1232.84	101.9	73	126
MANGANESE	261.0	254.87	97.7	78	122
NICKEL	68.3	61.78	90.5	56	144
POTASSIUM	1500.0	1702.09	113.5	64	136
SELENIUM	123.0	114.89	93.4	74	126
SILVER	57.2	51.14	89.4	71	128
SODIUM	1380.0	1261.18	91.4	68	133
THALLIUM	80.0	90.47	113.1	57	142
VANADIUM	95.4	92.05	96.5	68	132
ZINC	190.0	180.88	95.2	76	124

7

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services Sample ID:

Sample ID: LCSWPI28HGW0

Matrix: WATER SDG Name: WP4075

QC Batch ID: PI28HGW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	TRUE	FOUND	% R	LIMITS (%)
MERCURY	5.0	4.59	91.8	80 120

7 LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services Sample ID: LCSWPJ07ICW0

Matrix: WATER SDG Name: WP4075

QC Batch ID: PJ071CW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

TRUE	FOUND	% R	LIMIT	'S (%)
2000.0	2056.51	102.8	80	120
500.0	498.28	99.7	80	120
2000.0	1978.88	98.9	80	120
2000.0	2154.32	107.7	80	120
50.0	51.22	102.4	80	120
50.0	53.82	107.6	80	120
2500.0	2622.88	104.9	80	120
200.0	209.72	104.9	80	120
500.0	519.15	103.8	80	120
250.0	255.13	102.1	80	120
1000.0	1080.01	108.0	80	120
500.0	554.80	111.0	80	120
5000.0	5099.18	102.0	80	120
500.0	514.62	102.9	80	120
500.0	519.61	103.9	80	120
25000.0	26210.36	104.8	80	120
2000.0	1880.36	94.0	80	120
50.0	44.81	89.6	80	120
7500.0	7792.18	103.9	80	120
2000.0	2210.97	110.5	80	120
500.0	520.42	104.1	80	120
500.0	501.49	100.3	80	120
	2000.0 500.0 2000.0 2000.0 50.0 50.0 2500.0 2500.0 250.0 1000.0 500.0 500.0 500.0 25000.0 25000.0 25000.0 25000.0 25000.0 2000.0 500.0 500.0	2000.0 2056.51 500.0 498.28 2000.0 1978.88 2000.0 2154.32 50.0 51.22 50.0 53.82 2500.0 2622.88 200.0 209.72 500.0 519.15 250.0 255.13 1000.0 1080.01 500.0 554.80 500.0 5099.18 500.0 514.62 500.0 519.61 25000.0 26210.36 2000.0 1880.36 50.0 44.81 7500.0 7792.18 2000.0 520.42	2000.0 2056.51 102.8 500.0 498.28 99.7 2000.0 1978.88 98.9 2000.0 2154.32 107.7 50.0 51.22 102.4 50.0 53.82 107.6 2500.0 2622.88 104.9 200.0 209.72 104.9 500.0 519.15 103.8 250.0 255.13 102.1 1000.0 1080.01 108.0 500.0 554.80 111.0 500.0 54.80 111.0 500.0 599.18 102.0 500.0 514.62 102.9 500.0 519.61 103.9 25000.0 26210.36 104.8 2000.0 1880.36 94.0 50.0 44.81 89.6 7500.0 7792.18 103.9 2000.0 2210.97 110.5 500.0 520.42 104.1	2000.0 2056.51 102.8 80 500.0 498.28 99.7 80 2000.0 1978.88 98.9 80 2000.0 2154.32 107.7 80 50.0 51.22 102.4 80 50.0 53.82 107.6 80 2500.0 2622.88 104.9 80 200.0 209.72 104.9 80 500.0 519.15 103.8 80 250.0 255.13 102.1 80 1000.0 1080.01 108.0 80 500.0 554.80 111.0 80 500.0 599.18 102.0 80 500.0 519.61 103.9 80 25000.0 26210.36 104.8 80 25000.0 26210.36 104.8 80 2000.0 1880.36 94.0 80 50.0 7792.18 103.9 80 2000.0 2210.97 110.5 80 500.0 520.42 104.1 80

5A SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Client Field ID: 23SLB040203S

Matrix: SOIL

SDG Name:

WP4075

Percent Solids: 66.1

Lab Sample ID: WP4075-030S

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

	Spiked	Sample	Spike		Control Liz	nits (%R)	
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M
LEAD	128.0622	64.1099	62.55	102.2	75	125	P

5A SPIKE SAMPLE RECOVERY

Lab Name: Katahdin Analytical Services

Client Field ID: 23SLB040203S

Matrix: SOIL

SDG Name: WP4075

Percent Solids: 66.1

Lab Sample ID: WP4075-030P

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

	Spiked	Sample	Spike		Control Limits (%R)		
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M
LEAD	I45.8800	64.1099	63.07	129.6 N	75	125	P

5D SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Client Field ID: 23SLB040203

Matrix: SOIL

SDG Name:

WP4075

Percent Solids: 66.1

Lab Sample ID: WP4075-030

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

Analyte	Control Limits	Spike Result C	Spike Dup. Result C	RPD	Q M	I
LEAD		128.0622	145.8800	13.0	P	



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION			MATRIX		
	=======		=========	-========	=====
METHOD BLANK			Solid/Soil	l/Sludge	
	========			========	=====
ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Solids-Total Residue (TS)	10-02-99	wt %	CTb/CI	<0.10	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect samplespecific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/27/99

^[1] Sample Preparation on 10-01-99 by BAD



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION				MA	TRIX		
=======================================	=======================================	=======================================				======	=====
LAB CONTROL SPIKE				So	lid/soil/s	ludge	
======================================			320000722E	===== ==	200722260	=======	=====
ANALYTE	ANALYZED UNITS	METHOD	SPK :	SPK RES	% REC	LIMITS	NOTES
Solids-Total Residue (TS)	10-02-99 wt %	CTb/CI	90	88.1	98		1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/27/99

^[1] Sample Preparation on 10-01-99 by BAD



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF DUPLICATE SAMPLE RESULTS

SAMPLE DESCR	IPTION						MATRIX		
						Solid/Soil,	_		
ANALYTE	ANALYZED		METHOD	*PQL	RESULT	DUP #1	RPD	LIMITS	NOTES
Solids- Total Residue (TS)	10-02-99	wt %	CITA/CI	0.10	83.	84.9	2.3		1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/27/99

^[1] Sample Preparation on 10-01-99 by BAD



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF DUPLICATE SAMPLE RESULTS

SAMPLE DESCR	IPTION						MATRIX		
==========							=========		
QC DUPLICATE							Solid/Soil/	/Sludge	
======================================		.=======	=======				==========		=====
ANALYTE	ANALYZED	UNITS	METHOD	*PQL	RESULT	DUP #1	RPD	LIMITS	NOTES
		= +							
Solids-	10-02-99	wt %	CLP/CI	0.10	54.	55.4	2.6		1
Total									
Residue (TS)									
(15)									

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results armotated with '<' values. See cover letter for additional information

10/27/99

^[1] Sample Preparation on 10-01-99 by BAD

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092999

Lab Name: Katahdin Analytical Services

SDG No.: WP4075

Lab File ID:

Z2214

Lab Sample ID: SBLK;092999

Instrument ID:

5972-Z

Date Extracted: 9/29/99

GC Column: RTX-5

ID: 0.25 (mm) Date Analyzed: 09/30/99

Matrix: (soil/water) SOIL

Time Analyzed: 20:34

Level: (low/med) LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample iD	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092999	LCS;092999	Z2215	9/30/99	9:23:00 PM
36SLB040304	WP4075-11	Z2220	10/1/99	1:05:00 PM
36SLB070304	WP4075-12	Z2221	10/1/99	1:51:00 PM
23SLB060001	WP4075-26	Z2225	10/1/99	4:57:00 PM
23SLB010203	WP4075-28	Z2227	10/1/99	6:32:00 PM
23SLB030203D	WP4075-29	Z.2228	10/1/99	7:18:00 PM
36SLB060304	WP4075-33	Z2231	10/1/99	9:40:00 PM
26SLB140405	WP4075-34	Z2232	10/1/99	10:28:00 PM
23SLB040203	WP4075-30	Z2236	10/4/99	10:07:00 AM
36SLB060304	WP4075-33DL	Z2237	10/4/99	10:54:00 AM
26SLB360405	WP4075-14	Z2238	10/4/99	11:41:00 AM
23SLB050203	WP4075-25	Z2240	10/4/99	1:16:00 PM
23SLB080203	WP4075-27	Z2241	10/4/99	2:03:00 PM
23SLB130203	WP4075-31	Z2242	10/4/99	2:50:00 PM
23SLB030203	WP4075-32	Z2243	10/4/99	3:38:00 PM
26SLB350405	WP4075-13	Z2263	10/5/99	6:06:00 PM
26SLB350405MS	WP4075-13MS	Z2264	10/5/99	6:53:00 PM
26SLB350405MSD	WP4075-13MSD	Z2265	10/5/99	7:42:00 PM
26SLB360405	WP4075-14DL	Z2266	10/5/99	8:29:00 PM



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

SBLK:092999

SDG:

WP4075

Report Date:

10/9/99 N7912-P99264

PO No.: Project:

CTO #68

% Solids:

Method:

EPA 8270

Date Analyzed: 9/30/99

Sample Description	Matrix Sar	πpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092999	ŞL	•	•	9/29/99	DPD	SW3550	KRT
Compound	Result	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<330	ид/Кд	1.0	330	330		
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHENE	<330	ug/Kg	1.0	330	330		
FLUORENE	<330	ug/Kg	1.0	330	330		
PHENANTHRENE	<330	ug/Kg	1,0	330	330		
ANTHRACENE	<330	ug/Kg	1.0	330	330		
FLUORANTHENE	<330	ug/Kg	1.0	330	330		
PYRENE	<330	ug/Kg	1.0	330	330		
:NZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330		
HRYSENE	<330	ug/Kg	1.0	330	330		
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO[A]PYRENE	<330	ug/Kg	1,0	330	330		
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330		
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330		
BENZO[G,H,I]PERYLENE	<330	ug/Kg	1,0	330	330		
NITROBENZENE-D5	50	%	1.0				
2-FLUOROBIPHENYL	51	%	1.0				
TERPHENYL-D14	57	%	1.0				

port Notes:

Katahdin Analytical Services **8270 LCS Recovery Sheet**

Lab File: Z2215

Sample ID: LCS;092999

Date Run: 9/30/99

Analyst: KRT

Time Injected 9:23:00 PM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1250	75	60-140
ACENAPHTHENE	1667	1100	66	60-140
ACENAPHTHYLENE	1667	1260	76	60-140
ANTHRACENE	1667	1230	74	60-140
BENZO[A]ANTHRACENE	1667	1260	76	60-140
BENZO[A]PYRENE	1667	1220	73	60-140
BENZO[B]FLUORANTHENE	1667	1230	74	60-140
BENZO[G,H,I]PERYLENE	1667	1160	70	60-140
BENZO[K]FLUORANTHENE	1667	1320	80	60-140
CHRYSENE	1667	1230	74	60-140
DIBENZ[A,H]ANTHRACENE	1667	1350	81	60-140
FLUORANTHENE	1667	1320	79	60-140
FLUORENE	1667	1170	70	60-140
NDENO[1,2,3-CD]PYRENE	1667	1280	77	60-140
NAPHTHALENE	1667	. 1160	70	60-140
PHENANTHRENE	1667	1250	75	60-140
PYRENE	1667	1280	77	60-140

Katahdin Analytical Services MS/MSD Report

ample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP4075-13	Z2263	10/5/99	6:06:00 PM	KRT	SL	8270_99
WP4075-13MS	Z2264	10/5/99	6:53:00 PM	KRT	SL	8270_99
WP4075-13MSD	Z2265	10/5/99	7:42:00 PM	KRT	SL	8270_99

Compound Name	Native (ug/Kg)	MS Spk Amount (ug/Kg)	MSD Spk Amount (ug/Kg)	MS Result (ug/Kg)	MSD Result (ug/Kg)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	1910	1910	1430	1650	75	86	60-140	14	50
ACENAPHTHENE	0	1910	1910	1260	1520	66	79	60-140	19	50
ACENAPHTHYLENE	0	1910	1910	1430	1720	75	90	60-140	18	50
ANTHRACENE	0	1910	1910	1490	1770	78	93	60-140	17	50
BENZO[A]ANTHRACENE	0	1910	1910	1520	1740	79	91	60-140	13	50
BENZO[A]PYRENE	0	1910	1910	1420	1630	74	85	60-140	14	50
BENZO[B]FLUORANTHENE	0	1910	1910	1370	1620	72	84	60-140	17	50
2-METHYLNAPHTHALENE	0	1910	1910	1410	1690	74	89	60-140	18	50
BENZO[K]FLUORANTHENE	0	1910	1910	1520	1790	80	94	60-140	16	50
PYRENE	0	1910	1910	1480	1690	77	88	60-140	13	50
DIBENZ[A,H]ANTHRACENE	0	1910	1910	1560	1770	82	93	60-140	13	50
FLUORANTHENE	0	1910	1910	1630	1900	85	99	60-140	15	50
FLUORENE	0	1910	1910	1430	1690	75	89	60-140	17	50
INDENO[1,2,3-CD]PYRENE	0	1910	1910	1660	1740	87	91	60-140	4.7	50
NAPHTHALENE	0	1910	1910	1310	1550	68	81	60-140	17	50
INTHRENE	0	1910	1910	1600	1830	84	96	60-140	13	50
B [G,H,I]PERYLENE	0	1910	1910	1450	1620	76	85	60-140	11	50

VOLATILE ORGANICS METHOD BLANK SUMMARY

(mm)

EPA SAMPLE NO.

VBLKU04A

Lab Name: Katahdin Analytical Services

SDG No.: WP4075

Lab File ID:

U1197

Lab Sample ID: VBLKU04A

Date Analyzed: 10/04/99

Time Analyzed: 9:35

GC Column: RTX-624 ID: 0.18

Heated Purge: (Y/N) N

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU04A	LCSU04A	U1196	10/4/99	8:35:00 AM
36\$LB060304	WP4075-33DL2	U1198	10/4/99	10:25:00 AM
36SLB060304MS	WP4075-33DLMS	U1203	10/4/99	1:39:00 PM
36SLB060304MSD	WP4075-33DLMSD	U1204	10/4/99	2:16:00 PM



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKU04A

SDG:

WP4075 10/15/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed: 10/4/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU04A	ΔQ	•		10/4/99	KMC	5030	KMC
Compaund	Res	sult Units	DF	Sample PQL	Method PQL		
BENZENE	<	5 ug/L	1.0	5	5		_
TOLUENE	<	รี ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<	5 ug/L	1.0	5	5		
ETHYLBENZENE	</td <td>5 ug√L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug√L	1.0	5	5		
NAPHTHALENE	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
MTBE	<	5 ug/L	1.0	5	5		
TOTAL XYLENES	<	5 ug/L	1.0	5	· 5		
DIBROMOFLUOROMETHANE	9-	-	í,ū				
1,2-DICHLOROETHANE-D4	82	2 %	1.0				
OLUENE-D8	9	9 %	1.0				
P-BROMOFLUOROBENZENE	10	14 %	1.0				

.ceport Notes:

10/16/99

erestining Considutes of

Client: Tetra Tech NUS
Work Order: WP4075

Laboratory Control Sample Results

Volatile Organics by GC/MS Method: 8260

Soil Matrix

Date of Analysis: 10/4/99

File: U1196

			- draw-	BEE GA	To relegation of
kompaja pali long palib long kepingke. Kompanakan malam unakan mengan <u>Kam</u>		Side !	Mining	* * * * · ·	Xerom
ne ateomorphic	a amil		L THELE	ALCENATE:	A STATE OF THE STA
1,2-Dibromoethane	ug/kg	50	50.2	100	60-140
Ethylbenzene	ug/kg	50	45.6	91	60-140
Benzene	ug/kg	50	46.8	94	60-140
MTBE	ug/kg	50	44.1	88	60-140
Naphthalene	ug/kg	50	49.6	99	60-140
Toluene	ug/kg	50	48.5	97	60-140
Total Xylenes	ug/kg	150	138	92	60-140

^{*} The laboratory uses the internally established statistical 99% confidence ranges for recovery as the acceptance criteria for this LCS.

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKM30A

Lab Name: Katahdin Analytical Services

SDG No.: WP4075

Lab File ID:

M2067

Lab Sample ID: VBLKM30A

Date Analyzed: 09/30/99

Time Analyzed: 10:13

GC Column: RTX-624 ID: 0.18

(mm)

Heated Purge: (Y/N) Y

Instrument ID: 5972-M

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSM30A	LCSM30A	M2066	9/30/99	9:22:00 AM
26\$LB360405	WP4075-22	M2068	9/30/99	11:08:00 AM
36SLB070304	WP4075-23RA	M2069	9/30/99	11:49:00 AM
23SLB080203	WP4075-27	M2070	9/30/99	12:31:00 PM
23SLB010203	WP4075-28	M2071	9/30/99	1:12:00 PM
23SLB030203D	WP4075-29	M2072	9/30/99	1:53:00 PM
23SLB130203	WP4075-31	M2074	9/30/99	3:16:00 PM
36SLB060304	WP4075-33	M2076	9/30/99	4:38:00 PM



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKM30A

SDG:

WP4075

Report Date:

10/15/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

100

Method:

SW8260

Date Analyzed: 9/30/99

Sample Description	Matrix	Samp	oled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKM30A	SL		•	<u>.</u>	9/30/99	КМС	5030	KMC
Compound	R	esult	Units	DF	Sample PQL	Method PGL		
BENZENE		<5	ug/Kg	1.0	5	5		
TOLUENE		<5	ug/Kg	1.0	5	5		
1,2-DIBROMOETHANE		<5	ug/Kg	1.0	5	5		
ETHYLBENZENE		<5	ug/Kg	1.0	5	5		
NAPHTHALENE		<5	ug/Kg	1.0	5	5		
MTBE		<5	ug/Kg	1.0	5	5		
TOTAL XYLENES		<5	ug/Kg	1.0	5	5		
DIBROMOFLUOROMETHANE	•	127	%	1.0				
1,2-DICHLOROETHANE-D4	•	125	%	1.0				
TOLUENE-D8	•	114	%	1.0				
P-BROMOFLUOROBENZENE	•	108	%	1.0				

Report Notes:

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: M2066

Sample ID: LCSM30A

Date Run: 9/30/99

Analyst: JSS

Time Injected 9:22:00 AM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	52.6	105	60-140
BENZENE	50	50.7	101	60-140
ETHYLBENZENE	50	51.5	103	60-140
MTBE	50	55.2	110	60-140
NAPHTHALENE	50	65.4	131	60-140
TOLUENE	50	50.8	102	60-140
TOTAL XYLENES	150	148	99	60-140

VOLATILE ORGANICS METHOD BLANK SUMMARY

(mm)

EPA SAMPLE NO.

VBLKM29A

Lab Name: Katahdin Analytical Services

SDG No.: WP4075

Lab Sample ID: VBLKM29A

Date Analyzed: 09/29/99

Time Analyzed: 10:31

GC Column: RTX-624 ID: 0.18

Lab File ID:

Heated Purge: (Y/N) Y

Instrument ID: 5972-M

M2049

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time injected
LCSM29A	LCSM29A	M2048	9/29/99	9:40:00 AM
26SLB350405	WP4075-21	M2057	9/29/99	4:16:00 PM
36SLB070304	WP4075-23	M2059	9/29/99	5:38:00 PM
36SLB040304	WP4075-24	M2060	9/29/99	6:20:00 PM
23SLB050203	WP4075-25	M2061	9/29/99	7:01:00 PM
23SLB060001	WP4075-26	M2062	9/29/99	7:42:00 PM



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKM29A

SDG:

WP4075 10/15/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

100

Method:

SW8260

Date Analyzed:

9/29/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKM29A	SL	•	-	9/29/99	JSS	5030	JSS
Compound	Res	ult Units	DF	Sample PQI	Method PQL		_
BENZENE	</td <td>5 ug/Kg</td> <td>1.0</td> <td>5</td> <td>5</td> <td>,</td> <td></td>	5 ug/Kg	1.0	5	5	,	
TOLUENE	<	5 ug/Kg	1.0	5	5		
1,2-DIBROMOETHANE	<{	5 ug/Kg	1.0	5	5		
ETHYLBENZENE	<	5 ug/Kg	1.0	5	5		
NAPHTHALENE	<	5 ug/Kg	1.0	5	5		
MTBE	<	5 ug/Kg	1.0	5	5		
TOTAL XYLENES	<	5 ug/Kg	1.0	5	5		
DIBROMOFLUOROMETHANE	12	o %	1.0				
1,2-DICHLOROETHANE-D4	11	0 %	1.0				
OLUENE-D8	12	6 %	1.0				
P-BROMOFLUOROBENZENE	11	9 %	1,0				

report Notes:

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: M2048

Sample ID: LCSM29A

Date Run: 9/29/99

Analyst: JSS

Time Injected 9:40:00 AM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	51.4	103	60-140
BENZENE	50	53.0	106	60-140
ETHYLBENZENE	50	51.3	103	60-140
MTBE	50	54.4	109	60-140
NAPHTHALENE	50	48.4	97	60-140
TOLUENE	50	51.9	104	60-140
TOTAL XYLENES	150	152	101	60-140

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU02A

Lab Name: Katahdin Analytical Services

SDG No.: WP4075

Lab File ID:

U1181

Lab Sample ID: VBLKU02A

Date Analyzed: 10/02/99

Time Analyzed: 13:09

GC Column: RTX-624 ID: 0.18

(mm)

Heated Purge: (Y/N) N

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU02B	LCSU02B	U1180	10/2/99	12:25:00 PM
36SLB060304	WP4075-33DL1	U1184	10/2/99	3:15:00 PM



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

P-BROMOFLUOROBENZENE

104

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKU02A

SDG:

WP4075

Report Date:

10/15/99

PO No.:

N7912-P99264

Project: % Solids: CTO #68

Method:

N/A

Date Analyzed: 10/2/99

SW8260

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU02A	AQ	•	· <u>-</u>	10/2/99	НМР	5030	НМР
Compound	Res	sult Units	DF	Sample PQL	Method PQL		
BENZENE	<:	5 ug/L	1.0	5	5		
TOLUENE	<	5 ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<	5 ug/L	1.0	5	5		
ETHYLBENZENE	<	5 ug/L	1.0	5	5		
NAPHTHALENE	</td <td>5 ug/L</td> <td>1,0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1,0	5	5		
MTBE	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
TOTAL XYLENES	<	5 ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE	10)5 %	1.0				
1,2-DICHLOROETHANE-D4	10	3 %	1.0				
TOLUENE-D8	10)1 %	1.0				

1.0

Report Notes:

10/16/99

Terephysiques Sarage, inc Quellig Controllisanos

Client: Tetra Tech NUS Work Order: WP4075

Laboratory Control Sample Results

Volatile Organics by GC/MS Method: 8260

Soil Matrix

Date of Analysis: 10/2/99 File: U1180

	De Promisi Company		MIZING	7	ARESTONE.
(eminonidi	and a critility	ro(60)jje in	il sakonii-	1100000	TO SEPTIMENT
1,2-Dibromoethane	ug/kg	50	51.7	103	60-140
Ethylbenzene	ug/kg	50	50.6	101	60-140
Benzene	ug/kg	50	50.6	101	60-140
MTBE	ug/kg	50	46.8	94	60-140
Naphthalene	ug/kg	50	48.5	97	60-140
Toluene	ug/kg	50	52.5	105	60-140
Total Xylenes	ug/kg	150	150	100	60-140

^{*} The laboratory uses the internally established statistical 99% confidence ranges for recovery as the acceptance criteria for this LCS.

CASE NARRATIVE

for

Katahdin Analytical Westbrook, ME

Former Charleston Naval Complex Site SDG #99740S

October 20, 1999

Laboratory Identification:

General Engineering Laboratories, Inc. (GEL)

Mailing Address:

P.O. Box 30712 Charleston, SC 29417

Express Mail Delivery and Shipping Address:

2040 Savage Rd Charleston, SC 29414

Telephone Number:

(843) 556-8171

Summarv:

Sample receipt

The samples from the former Charleston Naval Complex site arrived at General Engineering Laboratories, Inc., Charleston, SC on September 25, 1999, for environmental analyses. All sample containers arrived without any visible signs of tampering or breakage. The samples were delivered with chain of custody documentation and signatures.

The following samples were received by the laboratory:

Laboratory	Sample
Identification	<u>Description</u>
9909740-01	42SLB090304-
9909740-02	42SLB200203~
9909740-03	42SLB410304
9909740-04	42SLB270304
9909740-05	23SLB130203 to-

GENERAL ENGINEERING LABORATORIES

PO Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

(803) 556-8171 • Fax (803) 766-1178



9909740-06	23SLB030203 /
9909740-07	23SLB030203D/
9909740-08	36SLB040304
9909740-09	36SLB070304
9909740-10	26SLB350405 ′
9909740-11	36SLB060304
9909740-12	26SLB360405

Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Internal Chain of Custody:

Custody was maintained for all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Data Qualifier Definitions, Chain of Custody, Cooler Receipt Checklist, and General Chemistry Analysis.

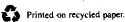
The following are definitions of reporting limits used at General Engineering Laboratories:

Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The detection limit is the minimum concentration of a substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is above zero. It answers the question "Is It Present."

QL <u>Ouantitation Limit:</u> The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The QL is generally 5 to 10 times the MDL. However, it may be nominally chosen within these guidelines to simplify data reporting. For many analytes the QL analyte concentration is selected as the lowest non-zero standard in the calibration curve.

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Sample QL's are highly matrix-dependent. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The QL is always \geq DL.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Valerie S. Davis Project Manager

fc:kata9909740%

General Engineering Laboratories, Inc.

DATA QUALIFIERS FOR INORGANIC ANALYSES

Data Qualifiers used on Form 1s or Certificates of Analysis (C 0f A) follow the specifications set forth in the technical specifications of the most current CLP Statement of Work and are defined as follows:

Section	Explanation	Location
Ε	The qualifier that is used when the percent difference between the	Form 1.
;	parent sample and its serial dilution's concentrations exceeds	and EDD
•	10%. The sample's concentration must be greater than 50 times	
	the IDL/MDL for ICP (6010B/ILMO 3.0) or 100 times the	
	absolute value of the preparation blank's concentration (6020).	ļ
	However, if analyzing ILMO 4.0 (ICP-MS), the parent sample's	
	concentration must be 20 times the CRDL before the "E" flag is	
	applied.	
*	The qualifier that is used to indicate that the duplicate sample	Form 1,
	analysis for an analyte is our of control.	and EDD
÷	Correlation coefficient the Method of Standard Addition (MSA)	Form 2.
	is less than 0.095.	and EDD
B	The qualifier is used to indicate that the reported result fell above	Form 1.
	the IDL/MDL but below the CRDL	and EDD
M	The qualifier is used to indicate that the replicate injection	Form 1,
!	readings of the GFAA sample analysis do not agree within 20%	and EDD
	relative standard deviation (RSD) or coefficient of variation (CV).	
N	This qualifier is used to indicate that the matrix or pre-digested	Form 1.
[spike sample recovery for an analyte is not within the specified	and EDD
<u></u>	control limit	
; s	The reported value was determined by the Method of Standard	Form 1.
<u> </u>	Addition (MSA).	and EDD
t l	The analyte's result was less than the IDL/MDL.	C of A. Form 1.
		and EDD
w	Post-digestion spike for GFAA analysis is out of control limits	EDD, and
	(85%-115%), while sample results are less than 50% of the spike	Form 5, part 2
	absorbance.	
X	Other reporting flag as defined in report narrative.	Form 1.
<u> </u>		and EDD
**	This qualifier is used to indicate that the Laboratory Control	QC Summary
	Sample (LCS) recovery for an analyte is outside of the specified	Report
	limits.	

All surrogate recoveries and acceptance ranges are reported at the bottom of Form 2 or C of A.

Any recoveries falling outside the acceptance range will be flagged with a **.

All flags do not apply to QC Summary and Certificate of Analysis packages.

General Engineering Laboratories, Inc. 2040 Savage Road Charleston, South Carolina 29407 CHAIN OF CUSTODY RECORD P.O. Box 30712 Charleston, South Carolina 29417 (803) 556-8171 9909740%

Client Name/Facility Name				\top		SAM	PLE A	NAL)	(SIS R	EQUI	RED (x) - us	e remar	ks area	to spec	бу врес	ific con	pound	s or me	thods		, U	se F or P in the boxes to indicate whether	
Katahdin /charlesten	Javal Ce	لرمع	lex	SE	\vdash	Щ.		4			_Ļ		Щ	Щ.			$\vdash \vdash$		ĻĹ			•	sample was filtered and/or preserved	
Collected by/Company		/-		<u> </u>	¥i.			orice a	9	Ž.	1				ablex	bles			ecify				1/2721	
Reger Franklin/Tetra To	eck NU	5			P P	8		4		Spect	LS-F	4	훈	benot	xtract	tracta		<u>.</u>	E	*		4	= 42726	
Katahdin / charleston M Collected by/Company Reger Franklin/Tetra To SAMPLE ID DATE	TIME	WELL	COME	F OF C	pH, conductivity	TDC/DOC	ХÔТ	Chloride, Phoride, Sulfide	Nitrite/Nitrate	VOC · Specify Method required	META	Pentick	Herbicide	Total P	Acid Extractables	B/N Extractables	PCB's	Cyanide	Coliform - specify type	TPH			Remarks	
425LB090304 1/24/79	1035	×																		X				
425LB200203 9/24/99	1050)		×																X	_	•		
425LB410304 9/24/89	1	×															l			X				
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36SLB040304 7/24/49	0100	<u> </u> x	<u>(</u>	4			ļ 		<u> </u>											Х				
365LB070304 9/23/99	1210	<u> </u> x		4															<u> </u>	X				
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36568060304 1/24/99	1647	1/1		<u> </u>									_					L		X			· 	
26\$48360405 9/23/99	1610) 	\coprod	4_																X				
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Page____ of ____

FEDERAL SAMPLE RECEIPT REVIEW

Client K+TA Received by ACC			Date 9-25-59
GEL COOLER GEL POLY COOLER CLIEN	ТC	001	LER OTHER 🛩
		•	
SAMPLE REVIEW CRITERIA	YES	1/0	COMMENTS/QUALIFIERS
Were shipping containers received intact and sealed? If no. notify Project Manager	~	· -	
Was the Shipment screened following the radiochemistry survey procedure (EPI SOP S-007)?		_	
Were the survey results negative? If no, notify Project Manager	<u></u>		
Are any of the samples identified by the client as radioactive? If ves, did client provide RAD activity?		_	
3. Were chain of custody documents included?	_		
Were chain of custody documents completed correctly? (Ink. signed, match containers)	-		
5. Were all sample containers properly labeled?	_		
6. Were proper sample containers received?	_		
7. Preserved samples checked for pH?	_		50,1
Were samples preserved correctly? If no, list samples & tests	/		
9. Shipping container temperature checked?	_		
10. Was shipping constiner temperature within specifications (4°± 2° C) If no. notify Project Manager	را		4°C
11. Is temperature documented on the Chain of Custody?		_	
12. Were samples received within holding time? if No. notify Project Manger	_		
13. Were VOA vials free of headspace?	_		
14. ARCOC# IF REQUIRED	1		
15. SDG# IF REQUIRED	-		99740
REVIEW Metian Manufa DATE 9-25-99 SA-SE	ALS	ATT	TACHED NSA NO SEALS ATTACHED

Case Narrative for KATA SDG# 99740S

TOTAL PETROLEUM HYDROCARBONS

Analytical Batch Number: 160400

Analytical Method: SW846 9071A

Laboratory Number	Sample Description					
9909740-01	42SLB090304					
9909740-02	42SLB200203					
9909740-03	42SLB410304					
9909740-06	23SLB030203					
9909740-07	23SLB030203D					
9909740-11	36SLB060304					
QC656386	Blank					
QC656387	Laboratory Control Sample					
QC656388	Matrix Spike of 9909740-01					
QC656389	Duplicate of 9909740-01					

Sample Preparation:

All samples were prepared in accordance with accepted procedures.

Instrument Calibration:

The instrument was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spike was run on the following Sample Number.

9909740-01

All analyte recoveries in the matrix spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

TOTAL PETROLEUM HYDROCARBONS

Analytical Batch Number: 159321

Analytical Method: SW846 9071A

Laboratory Number	Sample Description	
9909740-08	36SLB040304	
9909740-09	36SLB070304	
9909740-10	26SLB350405	
9909740-12	26SLB360405	
QC652076	Blank	
QC652077	Laboratory Control Sample	
QC652078	Matrix Spike of 9909644-02	
QC652079	Duplicate of 9909644-02	

Sample Preparation:

All samples were prepared in accordance with accepted procedures.

Instrument Calibration:

The instrument was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The matrix spike was run on the following Sample Number from another SDG.

9909644-02

All analyte recoveries in the matrix spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

The following Nonconformance Report was written for this batch.

GEL-AS-GC-1615

TOTAL ORGANIC CARBON

Analytical Batch Number: 159373

Analytical Method: SW846 9060 Modified

Laboratory Number	Sample Description						
9909740-04	42SLB270304						
9909740-05	23SLB130203						
QC652303	Blank						
QC652304	Laboratory Control Sample						
QC652305	Duplicate of 9909644-04						
QC652306	Post Spike of 9909644-04						

Sample Preparation:

All samples were prepared in accordance with accepted procedures. The method quoted is only for liquid samples. It is modified to handle soils analysis.

Instrument Calibration:

The instrument used was a Dohrmann DC-190 high temperature combustion TOC analyzer with a Dohrmann solids boat sampler. The instrument was properly calibrated on the day of the analysis.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit.

Spike Analyses:

The post spike was run on the following Sample Number from another SDG.

9909644-04

All analyte recoveries in the post spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

Additional Comments:

TOC solid samples are tested to determine if inorganic carbon such as carbonates and bicarbonates are present in the sample. If so, the sample is acidified to remove the inorganic carbon, then dried in a low temperature oven. Because the sample portion is dried before analysis, the percent moisture correction is not applied to the TOC solid result.

The preceding narratives have been reviewed by: $\sqrt{\frac{9}{20/55}}$ Date: $\sqrt{\frac{20/55}{10/20/55}}$

General Engineering Laboratories CONTROLLED DOCUMENT in GET-XXXX
.v. 09/98)

ı.	NCR Report No.:	CEC-4	F-Cc-	1615	_	_
		2	Page	rion M	oť _	1

	CONFORMANCE REPORT						
	EVERYITEM						
(See Instruction	is on Reverse Side)						
4. Mo. Day Yr. 5. Division: Industrial Fe	deral 6. Type: Material Process						
	<u> </u>						
<u> </u>	y Other Product						
7. Instrument Type: 8. Quality C	Criteria: SOP QAP or QAPJP Client Contract						
N/A Purchase	Document Drawing Specifications Others						
9. Supplier/Client Name & Code:	IIO. Test/Method:						
2. Supplied Cheff Hands & Code:	ACT TOO BELLIOTE						
Vora -	FAR GOTE (
111 Nymerical Defendant Library (Best News)	S-le Ni-ber ID						
11. Numerical Reference Identification: (Batch Numb	ez, Sample Palmoer, ID number)						
1441: 13810 c 1. 00 c							
12. Specifications and Requirements	(f) / - / 2.						
12. Specifications and Requirements	14. NRG Disposition:						
Nonconformance Description:							
T 37-	·						
Item No. Samples were not comme	Item No.						
) July 1	Samples were accidently not						
into Analysts Calledy	scanned to the analyst's custody						
1~ PS MAN 95 +7 C4 17084	to the draining costering						
·	prior to analysis but the analyst						
	did physically have custody of						
, ·	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
· ·	samples during analysis. Analyst						
	is aware of oversight.						
	in the street of						
	• •						
	•						
MEGEOVER							
	15. NRG's Printed Name & Signature Date						
	·						
	Arche Tal- 111 di - 200						
	11-7 117.5 17860 7A100						
	List NRG Participants:						
13. Originator's Printed Name & Signature Date	DEIDRE REILLY 9/30/97						
11/ 10/ 61/ 1/ 3-475	Management Review or Management Approval						
Blk Tale forther tack							
77 77 77							
Diance review within	n 24 hours of receipt						
r energe rener with	010544						
NCR Review & Discosition Review of Approval:	Corrective Action Records and Action 2						
11c. Quality Review:	Connective Action Request and Approval: VD						
1.0. Certify yealest	13. CA Requested: Print Name and Sign Date						
11/1/20	. !						
11/1/1	3 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -						
1. Cristinuter's Director/Group Ladded Date	A Contentive Action Appearance Surpeys Contention						

Client:

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 18, 1999

Page 1 of 1

Sample ID Lab ID : 36SLB040304

Matrix

: 9909740-08 : Soil

Date Collected
Date Received

: 09/23/99

Priority

: 09/25/99 : Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	•	st Date	Time	Batch	M
General Chemistr	y										
Total Rec. Petro, I	Hydrocarbons	1300	112	224	mg/kg	1.0	AAT	09/30/99	1140	159321	. 1
Evaporative Loss	@ 105 C	11.0	1.00	1.00	wt%	1.0	C3	09/28/99	1550	159267	2

M = Method	Method-Description	
M 1	SW846 9071A	
M 2	EPA 3550	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager. Valerie Davie at (8)

any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Client:

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 18, 1999

: 36SLB070304

: 9909740-09

Page 1 of 1

Sample ID
Lab ID
Matrix
Date Collected
Date Received
Priority

Collector

: Soil : 09/23/99 : 09/25/99 : Routine : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	•	Time	Batch M
General Chemistry										
Total Rec. Petro. H	ydrocarbons	351	119	238	mg/kg	1.0	AAT	09/30/99	1140	159321 1
Evaporative Loss @	105 C	16.0	1.00	1.00	wt%	1.0	G J	09/28/99	1550	159267 2

M = Method	Method-Description	
М 1	SW846 9071A	
M 2	EPA 3550	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Just n. had

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By



Client:

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 18, 1999

Page 1 of 1

Sample ID Lab ID Matrix : 36SLB060304 : 9909740-11

Date Collected
Date Received

: Soil : 09/24/99 : 09/25/99

Priority Collector : Routine : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	st Date	Time	Batch	M
General Chemistr	7				·						
Total Rec. Petro.	Hydrocarbons J	234	123	246	mg/kg	1.0	AAT	10/12/99	1000	160400	1
Evaporative Loss	@ 105 C	19.0	1.00	1.00	w1%	1.0	GJ	09/28/99	1550	159267	2

M = Method	Method-Description	
M 1	SW846 9071A	
M 2	EPA 3550	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

ON AN EN EN EN AN EN EN EN EN EN EN EN EN

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

QC Summary Report

Project Description:

Former Naval Complex

cc: KATA00199

Lab. Sample ID: 9909740%

Report Date: October 19, 1999

Page 1 of 1

Sample/Parameter	Type	Batch	NOM	Sample	Qual QC	Units	RPD%	REC%	Range	Analyst	Date	Time
General Chemistry												
QC652076	BLANK	159321										
Total Rec. Petro. Hy	drocarbons				90.0	mg/kg				AAT	09/30/99	1140
QC656386	BLANK	160400										
Total Rec. Petro. Hy					115	mg/kg				AAT	10/12/99	1000
QC652079 99096	544-02DUP	159321										
Total Rec. Petro. Hy	drocarbons			576	451	mg/kg	24.3			LAA	09/30/99	1140
•	740-01DUP	160400										
Total Rec. Petro. Hy				603	761	mg/kg	23.1			TAA	10/12/99	1000
QC652077		159321										
Total Rec. Petro, Hy	drocarbons		10800		7550	mg/kg		70.1	(70.0 - 11	16.) AAT	: 09/30/9 9	1140
QC656387		160400										
Total Rec. Petro. Hy	drocarbons		11100		10100	mg/kg		91.1	(70.0 - 1)	16.) AAT	10/12/99	1000
QC652078 9909	9644-02MS	159321										
Total Rec. Petro. Hy	drocarbons		17100	576	14400	mg/kg		80.6	(70.0 - 13	30.) AAT	09/30/99	1140
QC656388 9909	9740-01MS	160400										
Total Rec. Petro. Hy	drocarbons		11700	603	10700	mg/kg		86.6	(70.0 - 13	30.) AAT	10/12/99	1000
QC651869	BLANK	159267										
Evaporative Loss @	105 C				0.00	wt%				GJ	09/28/99	1550
QC651867 99097	740-12DUP	159267										
Evaporative Loss @	105 C			17.0	17.0	wt%	0.00					
QC651868 99098	315-01DUP	159267										
Evaporative Loss @	105 C			30.0	30.0	wt%	0.00					
QC652303	BLANK	159373										
Total Organic Carbo	on.				5.80	mg/kg				JB1	09/30/99	1242
QC652305 99096	544-04DUP	159373										
Total Organic Carbo	ni.			2840	2960	mg/kg	4.07			JB1	09/30/99	1403
QC652304		1593 <i>T</i> 3										
Total Organic Carbo	n		4000		4660	mg/kg		117	(88.0 - 1	30.) JB1	09/30/99	1249
•	9644-04 PS	1 <i>5</i> 93 <i>7</i> 3										
Total Organic Carbo	n		9410	2840	11800	mg/kg		94.6	(73.0 - 1	29.) JB1	09/30/99	1410
						_						

Notes:

The qualifiers in this report are defined as follows:

n/a indicates that spike recovery limits do not apply when sample concentration exceeds spike cone by a factor of 4 or more

I indicates presence of analyte < RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)



October 20, 1999

Mr. Paul Calligan

Tetra Tech Nus

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308



RE: Katahdin Lab Number:

WP4048

Project ID:

CNC Charleston

Project Manager:

Ms. Andrea J.Colby

Sample Receipt Date(s):

9/23/99

Dear Mr. Calligan:

Please find enclosed the following information:

- * Report of Analysis
- * Quality Control Data Summary
- * Chain of Custody
- Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Authorized Signature

10/20/99 Date



SDG NARRATIVE KATAHDIN ANALYTICAL SERVICES TETRA TECH NUS CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 23, 1999 and were logged in under Katahdin Analytical Services work order number WP4048 for a hardcopy due date of October 23, 1999.

KATAHDIN Sample No. WP4048-1 WP4048-2 WP4048-3 WP4048-4 WP4048-5 WP4048-6 WP4048-6 WP4048-7 WP4048-8	TTNUS Sample Identification 36SLB120304 36SLB120304D 36SLB010304 36SLB010304D 26GLX0101 26GLX0401 26GLX0501 26GLX0601	GEL Sample Identification 9909644-03 9909644-04 9909644-01 9909644-02
WP4048-6		
WP4048-7	26GLX0501	
WP4048-8	26GLX0601	
WP4048-9	26GLM0101	
WP4048-10	26GLX0201	
WP4048-11	26GLX0301	
WP4048-12	26GLM1101	
WP4048-13	26TL00301	

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Two soil/sediment and nine aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 23, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5972-S (aqueous), 5970-Q (aqueous), and 5972-M (low level soils) instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.



Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. An aqueous matrix spike/matrix spike duplicate analysis was performed on sample WP4048-8.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Two soil/sediment and eight aqueous samples were received by Katahdin Analytical Services laboratory on September 23, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of the soil samples occurred following USEPA method 3550 on September 24, 1999. A laboratory control spike was extracted in the batch, along with a site-specific MS/MSD pair on sample WP4048-3. Extraction of all of the aqueous samples occurred following USEPA method 3510 on September 24, 1999. A laboratory control sample/laboratory control sample duplicate pair was extracted in the batch.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.

Metals Analysis

The samples of Katahdin Work Order WP4048 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Soil-matrix Katahdin Sample Nos. WP4048-(3, 4) were digested for ICP analysis on 10/01/99 (QC Batch PJ01ICS0) in accordance with USEPA Method 3050B. The measured calcium (16.3 mg/kg) and sodium (11.5 mg/kg) concentrations of the preparation blank that is associated with this QC batch exceed the laboratory's acceptance limits. However, because the measured calcium and sodium concentrations of all associated samples are more than ten times those of the preparation blank, no corrective action was required.



ICP analyses of Katahdin Work Order WP4048 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomie Absorption (CVAA) Spectrophotometry

Soil-matrix Katahdin Sample Nos. WP4048-(3, 4) were digested for mercury analysis on 10/07/99 (QC Batch PJ07HGS1) in accordance with USEPA Method 7471A.

Mercury analyses of Katahdin Work Order WP4048 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) was performed according to the U.S. EPA, Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020, 1979, Revised 1983. Sulfate analyses (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. The analyses for Total Combustible Organics (TCO) have been performed in accordance with the "Annual Book of ASTM Standards", 1987. Analyses for Solids-Total Residue (TS) have been performed in accordance with "Contract Laboratory Program Statement of Work for Inorganic Analysis".

All samples were analyzed within analytical hold times. The Wet Chemistry staff noted no protocol deviations.

	· ·
	LAB (WORK ORDER) # 1294048
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	PAGE: \ OF 2
•	COOLER: OF 2
	COC#
-	SDG# DATE / TIME RECEIVED: 09-23-99-0900
	DELIVERED BY:
	RECEIVED BY: BKP
	LIMS ENTRY BY:
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Use this space (and additional liheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorina check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative artified

KATAHDIN ANALYTICAL SERVICES,	•	LAB (WORK ORDER) # 6 P 4048
SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400 Fax (207) 775-4029	OR I	PAGE: 2 OF 2
1 1. (20.)		COOLER: 2 OF 2
CLIENT: TETRATEZH NUS		COC#
PROJECT: CNC CHARLESTON/	10 #68	RECEIVED BY: LIMS ENTRY BY: LIMS REVIEW BY / PM: AC
		DMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?		
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?		
4. CHAIN OF CUSTODY MATCHES SAMPLES?		·
5. TEMPERATURE BLANKS PRESENT?		EMP BLANK TEMP (*C)=
6. SAMPLES RECEIVED AT 4°C +/-2? ICE ICE PACKS PRESENT Y OF N?		OOLER TEMP (°C)= NA RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?		
8. TRIP BLANK PRESENT IN THIS COOLER		
9. PROPER SAMPLE CONTAINERS AND VOLUME?		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?		
11. SAMPLES PROPERLY PRESERVED ⁽¹⁾ ?		
12. CORRECTIVE ACTION REPORT FILED?	□	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	IERCIAL CLP HAZWRAP (NFESC ACOE AF	CEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES ⁽¹⁾ :		
	,	

Katahdin 340 County Road No. 5 P.O. Box 720 Westbrook, ME 04098

CHAIN of CUSTODY

Fax: (207) 775-4029						PLEASE	PRIN	IN PE	1	Paç	ge <u>(</u>	of <u></u>
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Katahdin Katahdin 340 County Road No. 5 P.O. Box 720 Westbrook, ME 04098

CHAIN of CUSTODY

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New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 1

ORDER NO WP-4048 Project Manager: Andrea J. Colby ORDER DATE: 09/23/99 ORT TO: Paul Calligan PHONE: 850/385-9899 Tetra Tech NUS FAX: 850/385-9860 1401 Oven Park Dr., Suite 102 DUE: 23 OCT Tallahassee, FL 32308 FAC. ID: CNC CHARLESTON ACCOUNTS PAYABLE PHONE: 412/921-7090 INVOICE: PO: N7912-P99264 TETRA TECH NUS, INC. FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220 PROJECT: CTO #68 SAMPLED BY: R. FRANKLIN DELIVERED BY: FEDEX DISPOSE: AFTER 23 OCT ITEM LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4048-1 36SLB120304 22 SEP 1600 23 SEP SLWP4048-2 36SLB120304D 22 SEP 1600 METHOD OTY DETERMINATION PRICE AMOUNT Total Combustible Organics ASTM D2974 2 30.00 60.00 TOC Subcontract 2 60.00 120.00 TOTALS 2 90.00 180.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX WP4048-3 36SLB010304 22 SEP 1530 23 SEP SL WP4048-4 36SLB010304D 22 SEP 1530 DETERMINATION METHOD OTY PRICE AMOUNT Volatile Organics by 8260B SW8260 2 85.00 170.00 Polynuclear Aromatic Hydrocarbons 2 EPA 8270 135.00 270.00 Target Analyte List Metals, Total 100.00 2 200.00 Solids-Total Residue (TS) CLP/CIP SO 2 0.00 0.00 TPH Subcontract 2 75.00 150.00 TOTALS 2 395.00 790,00 LOG NUMBER SAMPLE DESCRIPTION _ SAMPLED DATE/TIME RECEIVED MATRIX WP4048-5 26GLX0101 22 SEP 1142 23 SEP ΑQ 22 SEP 1550 26GLX0401 WP4048-6 22 SEP 1548 WP4048-7 26GLX0501 22 SEP 1620 WP4048-8 26GLX0601 WP4048-9 26GLM0101 22 SEP 1100 DETERMINATION METHOD PRICE AMOUNT Volatile Organics by 8260B 5 SW8260 75.00 375.00 Polynuclear Aromatic Hydrocarbons EPA 8270 5 125.00 625.00

TOTALS

200.00

1000.00

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 2

ORDER NO WP-4048

Project Manager: Andrea J. Colby

ORDER DATE: 09/23/99

REPORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PHONE: 850/385-9' FAX: 850/385-96

PHONE: 412/921-7090

PO: N7912-P99264

DUE: 23 OCT

FAC.ID: CNC CHARLESTON

INVOICE: ACCOUNTS PAYABLE

TETRA TECH NUS, INC.

FOSTER PLAZA 7, 661 ANDERSEN DR.

PUBLICATION DE 15000

PITTSBURGH, PA 15220

PROJECT: CTO #68

SAMPLED BY: R. FRANKLIN

DELIVERED BY: FEDEX

DISPOSE: AFTER 23 OCT

3 325.00 975.00

LOG NUMBER SAMPLE DESCRIPTION	SAMPLED DATE	/TIME	RECEIVED	MATRIX
4 WP4048-10 26GLX0201	22 SEP	1035	23 SEP	AQ
WP4048-11 26GLX0301	22 SEP	1130		
WP4048-12 26GLM1101	22 SEP	1640		
DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
Nitrate as N	353.2	3	30.00	90.00
Sulfate	375.4	3	0.00	0.00
Methane Subcontract		3	95.00	285.00

LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE	/TIME	RECEIVED	$MATR \perp X$
5 WP4048-13	26TL00301	22 SEP)	23 SEP	ĀQ
DETERMINATIO	N	METHOD	OTY	PRICE	AMOUNT
Volatile Orga	anics by 8260B	SW8260	1	75.00	75.00

ORDER NOTE: QC-II+ W/NARRATIVE

DD(KAS007QC-DB3)

CNC CHARLESTON

REPORT COPY: MS LEE LECK

TOTALS

TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR

PITTSBURGH, PA 15220

REPORT & DISK

INVOICE: With Report

TOTAL ORDER AMOUNT \$3,020.

This is NOT an Invo. 2

AJC/BKR/WEST.AJC(dw)

09-29Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.



CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number: WP-4048-1

Report Date: 10/20/99 PO No. : N7912-P99264

Project : CTO #68

WICH: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 1 of 7

SAMPLE DESCRIPTION		MATRIX	:	SAMI	PLED BY	SAMPLED I	ATE	RECEIVED
36SLE120304		Solid		R. 1	FRANKLIN	09/22/9	9	09/23/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Combustible Organics	4.1	wt %	1.0	0.:	1 ASIM D2974-8	3 09/28/99	JF	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 09/27/99 by JF

10/20/99

LJO/ejnajc(dw)/msm PI27IOS1

CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR



CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number : WP-4048-2 Report Date: 10/20/99

PO No.

: N7912-P99264

Project

: CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 2 of 7

SAMPLE DESCRIPTION		MATRIX	4	SAMPI	ED BY	SAMPLED D	ATE	RECEIVED
36SLB120304D		Solid		R. FF	RANKLIN	09/22/9	9	09/23/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Total Combustible Organics	3.1	wt. 8	1.0	0.1	ASIM D2974-8	09/28/99	JF	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 09/27/99 by JF

10/20/99

LJO/ejnajc(dw)/msm PI27TOS1

CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR

I INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB010304

Matrix: SOIL

SDG Name:

WP4048

Percent Solids: 81.5

Lab Sample ID: WP4048-003

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	17500			P	1
7440-36-0	ANTIMONY	0.17	U		P	1
7440-38-2	ARSENIC	7.4			P	1
7440-39-3	BARIUM	25.3			P	1
7440-41-7	BERYLLIUM	0.61			P	1
7440-43-9	CADMIUM	0.28	В		P	1
7440-70-2	CALCIUM	22400			P	1
7440-47-3	CHROMIUM	84.4			P	1
7440-48-4	COBALT	12.0			P	1
7440-50-8	COPPER	14.1			P	1
7439-89-6	1RON	10200			P	1
7439-92-1	LEAD	25.6			P	1
7439-95-4	MAGNESIUM	3120			P	1
7439-96-5	MANGANESE	180			P	1
7439-97-6	MERCURY	0.10			CV	1
7440-02-0	NICKEL	21.8			P	1
7440-09-7	POTASSIUM	816			P	1
7782-49-2	SELENIUM	0.71	В		P	1
7440-22-4	SILVER	0.24	U		P	1
7440-23-5	SODIUM	271			P	1
7440-28-0	THALLIUM	0.42	U		P	1
7440-62-2	VANADIUM	25.2			P	1
7440-66-6	ZINC	95.2			P	1

Comments:



CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number: WP-4048-3 Report Date: 10/20/99

PO No.

: N7912-P99264

Project

: CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 3 of 7

SAMPLE DESCRIPTION		MATRIX		SAMPL	ED BY	SAMPL	ED D#	ATE	RECEIVED
36SLB010304		Solid		R. FR	ANKLIN	09/	22/99	9	09/23/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALY	ZED	BY	NOTES
Solids-Total Residue (TS)	82.	wt %	1.0	0.10	CLP/CIP SO	OW 09/28	/99	JF	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 09/27/99 by JF

10/20/99

LJO/ejnajc(dw)/msm PI27TSS4

CC: MS LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

Report Date:

WP4048-3

SDG:

WP4048 10/9/99

PO No.:

N7912-P99264

Project:

CTO#68

% Solids:

82

Method:

EPA 8270

Date Analyzed: 9/29/99

Sample Description	Matrix Sa	mpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB010304	SL	9/22/99	9/23/99	9/24/99	DPD	SW3550	KRT
Compound	Result	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<400	ug/Kg	1.2	400	330		
2-METHYLNAPHTHALENE	<400	ug/Kg	. 1.2	400	330		
ACENAPHTHYLENE	<400	ug/Kg	1.2	400	330		
ACENAPHTHENE	<400	ug/ Kg	1.2	400	330		
FLUORENE	<400	ug/Kg	1.2	400	330		
PHENANTHRENE	<400	ug/Kg	1.2	400	330		
ANTHRACENE	<400	ug/Kg	1.2	400	330		
FLUORANTHENE	<400	ug/ Kg	1.2	400	330		
PYRENE	<400	ug/Kg	1.2	400	330		
BENZO[A]ANTHRACENE	<400	ug/Kg	1.2	400	330		
CHRYSENE	<400	ц д/Кд	1.2	400	330		
BENZO[B]FLUORANTHENE	<400	ug/Kg	1.2	400	330		
BENZO[K]FLUORANTHENE	<400	ug/Kg	1.2	400	330		
BENZO[A]PYRENE	<400	ug/ Kg	1.2	400	330		•
INDENO[1,2,3-CD]PYRENE	<400	ug/ Kg	1.2	400	330		
DIBENZ[A,H]ANTHRACENE	<400	ug/Kg	1.2	400	330		
BENZO[G,H,I]PERYLENE	<400	ug/Kg	1.2	400	330		
NITROBENZENE-DS	68	96	1.2				
2-FLUOROBIPHENYL	72	96	1.2				
TERPHENYL-D14	87	%	1.2				

Report Notes:



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

nt: Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4048-3

SDG:

WP4048

Report Date:

10/7/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

82

Method:

SW8260

Date Analyzed: 9/28/99

Sample Description	Matrix	Sam	pled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB010304	SL 9/22/99		/22/99	2/99 9/23/99		HMP	5030	нмР
Compound	Re	sult	Units	DF	Sample PQL	Method PQL		
BENZENE		<6	ug/Kg	1.1	6	5		
TOLUENE	•	<6	ug/Kg	1.1	6	5		
1,2-DIBROMOETHANE	,	<6	ug/Kg	1.1	6	5		
ETHYLBENZENE	,	<6	ug/Kg	1.1	6	5		
NAPHTHALENE	,	<6	ид/Кд	1.1	6	5		
MTBE		<6	ug/Kg	1.1	6	5		
TOTAL XYLENES		<6	ug/Kg	1.1	6	5		
DIBROMOFLUOROMETHANE	1	02	%	1.1				
'-DICHLOROETHANE-D4	!	96	%	1.1				
LUENE-D8الس	1	01	%	1.1				
P-BROMOFLUOROBENZENE		67	%	1.1				

Report Notes:

INORGANIC ANALYSIS DATA SHEET

Lab Name: Katahdin Analytical Services

Client Field ID: 36SLB010304D

Matrix: SOIL

SDG Name: WP4048

Percent Solids: 73.2

Lab Sample ID: WP4048-004

Concentration Units (ug/L or mg/Kg dry weight): mg/Kg

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	18000			P	1
7440-36-0	ANTIMONY	0.35	В	•	P	1
7440-38-2	ARSENIC	7.1			P	1
7440-39-3	BARIUM	31.2	-		P	1
7440-41-7	BERYLLIUM	0.60			P	1
7440-43-9	CADMIUM	0.26	В		P	1
7440-70-2	CALCIUM	36500			P	5
7440-47-3	CHROMIUM	178			P	1
7440-48-4	COBALT	7.8			P	1
7440-50-8	COPPER	13.4			P	1
7439-89-6	1RON	9840			P	1
7439-92-1	LEAD	22.4			P	1
7439-95-4	MAGNESIUM	5970			P	1
7439-96-5	MANGANESE	167			P	1
7439-97-6	MERCURY	0.11			CV	1
7440-02-0	NICKEL	15.8			P	1
7440-09-7	POTASSIUM	986			P	1
7782-49-2	SELENIUM	0.49	В		P	1
7440-22-4	SILVER	0.19	U		P	1
7440-23-5	SODIUM	331			P	1
7440-28-0	THALLIUM	0.33	U		P	1
7440-62-2	VANADIUM	27.4			P	1
7440-66-6	ZINC	75.2			P	1

Comments:



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number: WP-4048-4

Report Date: 10/20/99

PO No.

: N7912-P99264

Project

: CTO #68

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 4 of 7

SAMPLE DESCRIPTION MATRIX				SAMPLED BY SAMPLED DATE F			RECEIVED	
36SLB010304D		Solid		R. FR	ANKLIN	09/22/9	9	09/23/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Solids-Total Residue (TS)	73.	wt %	1.0	0.10	CLP/CIP	SOW 09/28/99	JF	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

(1) Sample Preparation on 09/27/99 by JF

10/20/99

LJO/ejnajc(dw)/msm PI27TSS4 CC: MS LEE LECK TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP4048-4

SDG:

WP4048 10/9/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

73

Method:

EPA 8270 Date Analyzed: 9/29/99

Sample Description	Matrix	Sample	d Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36SLB010304D	SL	9/22	2/99	9/23/99	9/24/99	DPD	SW3550	KRT
Compound	Re	sult	Units	DF	Sample PQL	Method PQL		
NAPHTHAL E NE	<.	460	ug/Kg	1.4	460	330		
2-METHYLNAPHTHALENE	<4	460	ug/Kg	1.4	460	330		
ACENAPHTHYLENE	<4	460	ug/Kg	1.4	460	330		
ACENAPHTHENE	<4	460	ug/Kg	1.4	460	330		
FLUORENE	<4	160	ug/Kg	1.4	460	330		
PHENANTHRENE	8	40	ug/Kg	1.4	460	330		
ANTHRACENE	Ja	260	ug/Kg	1.4	460	330		
FLUORANTHENE	13	300	ug/Kg	1.4	460	330		
PYRENE	10	000	ug/Kg	1.4	460	330		
BENZO[A]ANTHRACENE	6	80	ug/Kg	1.4	460	330		
CHRYSENE	6	0 0	ug/Kg	1.4	460	330		
BENZO[B]FLUORANTHENE	6		ug/Kg	1.4	460	330		
BENZO[K]FLUORANTHENE	Ja		ug/Kg	1.4	460	330		
BENZO[A]PYRENE	J4	460	ug/Kg	1.4	460	330		
INDENO[1,2,3-CD]PYRENE	J	260	ug/Kg	1.4	460	330		
DIBENZ[A,H]ANTHRACENE	<.	460	ug/Kg	1.4	460	330		
BENZO[G,H,I]PERYLENE	J	240	ug/Kg	1.4	460	330		
NITROBENZENE-D5		58	%	1.4				
2-FLUOROBIPHENYL	7	76	%	1.4				
TERPHENYL-D14		38	%	1.4				

Report Notes:



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Vient:

Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Sample Description

Proj. ID: CNC CHARLESTON

Lab Number:

WP4048-4

SDG:

WP4048 10/7/99

Report Date: PO No.:

N7912-P99264

CTO #68

Project: % Solids:

73

Method: Date Analyzed: 9/28/99

SW8260

36SLB010304D	SL	9/22/99	9/23/99	9/28/99	НМР	5030	НМР
Compound	Result	Units	DF	Sample PQL	Method PQL		
BENZENE		ug/Kg	1.5	7	5		
TOLUENE	<7	ug/Kg	1.5	7	5		
1,2-DIBROMOETHANE	<7	ug/Kg	1.5	7	5		
ETHYLBENZENE	<7	ug/Kg	1.5	7	5		
NAPHTHALENE	<7	ug/Kg	1,5	7	5		
MTBE	<7	ug/Kg	1.5	7	5		
TOTAL XYLENES	<7	ug/Kg	1.5	7	. 2		
DIBROMOFLUOROMETHANE	94	%	1.5				
,2-DICHLOROETHANE-D4	87	%	1.5				
OLUENE-D8	92	%	1.5				
P-BROMOFLUOROBENZENE	73	%	1.5				

Report Notes:

3P PREPARATION BLANKS

Lab Name: Katahdin Analytical Services Sample ID: PBSPJ01ICS0

Matrix: SOIL SDG Name: WP4048

QC Batch ID: PJ01ICS0

\nalyte	RESULT	С
ALUMINUM	9.223	В
ANTIMONY	-0.205	В
ARSENIC	0.210	U
BARIUM	0.061	В
BERYLLIUM	0.020	U
CADMIUM	0.190	U
CALCIUM	16.324	
CHROMIUM	0.407	В
COBALT	0.060	U
OPPER	0.060	U
RON	0.669	В
EAD	0.110	U
IAGNESIUM	1.770	В
1ANGANESE	0.053	В
TICKEL	1.320	U
OTASSIUM	44.950	U
ELENIUM	0.260	U
ILVER	0.070	U
ODIUM	11.547	
HALLIUM	0.450	U
'ANADIUM	0.060	U
INC	0.153	В

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services Sample ID: LCSSPJ011CS0

Matrix: SOIL SDG Name: WP4048

QC Batch ID: PJ011CS0

			•		
Analyte	TRUE	FOUND	% R	LIMIT	S (%)
ALUMINUM	5720.0	5284.82	92.4	66	134
ANTIMONY	26.6	30.85	116.0	13	186
ARSENIC	163.0	179.02	109.8	62	138
BARIUM	195.0	246.23	126.3	66	134
BERYLLIUM	78.9	86.75	109.9	72	128
CADMIUM	114.0	115.92	101.7	74	124
CALCIUM	1280.0	1286.99	100.5	70	130
CHROMIUM	175.0	202.59	115.8	69	131
COBALT	73.7	83.62	113.5	70	130
COPPER	91.0	95.87	105.4	71	128
IRON	9080.0	8892.45	97.9	53	146
LEAD	66.0	83,22	126.1	68	132
MAGNESIUM	1210.0	1178.63	97.4	7 3	126
MANGANESE	261.0	289.32	110.9	78	122
NICKEL	68.3	75,55	110.6	56	144
POTASSIUM	1500.0	1373.71	91.6	64	136
SELENIUM	123.0	123.79	100.6	74	126
SILVER	57.2	53.95	94.3	71	128
SODIUM	1380.0	1402.75	101.6	68	133
THALLIUM	80.0	99.81	124.8	57	142
VANADIUM	95.4	108.52	113.8	68	132
ZINC	190.0	210.74	110.9	76	124

3P PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBSPJ07HGS1

Matrix: SOIL

SDG Name: WP4048

QC Batch ID: PJ07HGS1

Analyte	RESULT	C	
MERCURY	0.010	υ	

LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services

Sample ID: LCSSPJ07HGS1

Matrix: SOIL

SDG Name: WP4048

QC Batch ID: PJ07HGS1

Analyte	TRUE	FOUND	% R	LIMIT	S (%)
MERCURY	1.8	2,32	128.9	54	146



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION			MATRIX		
		*****			=====
METHOD BLANK			Solid/Soi	l/Sludge	
=======================================		=======	========		
ANALYTE	ANALYZED U	INITS	METHOD	RESULT	NOTES
Total Combustible Organics	09-28-99 w	vt %	ASTM D	<0.10	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect samplespecific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

[1] Sample Preparation on 09-27-99 by JF

10/19/99



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF DUPLICATE SAMPLE RESULTS

SAMPLE DESCRIPTION .								
				<u>=======</u>				=====
QC DUPLICATE	; :====================================					Solid/Soil/S	Sludge ======	. _
ANALYTE	ANALYZED UNITS	METHOD	*PQL	RESULT	DUP #1	RPD	LIMITS	NOTES
Total Combustible	09-28-99 wt % :Organics	ASTM D	0.1	4.1	4.10	-0.00		1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

^[1] Sample Preparation on 09-27-99 by JF



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LABORATORY METHOD BLANK RESULTS

SAMPLE DESCRIPTION			MATRIX		
				T=======	
METHOD BLANK			Solid/Soil	/Sludge	
				*=======	======
ANALYTE	ANALYZED	UNITS	METHOD	RESULT	NOTES
Solids-Total Residue (TS)	09-28-99	wt %	CITb/CI	<0.10	1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect samplespecific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

^[1] Sample Preparation on 09-27-99 by JF



Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PROJECT: CTO #68

REPORT OF LAB CONTROL SPIKE RESULTS

SAMPLE DESCRIPTION				MATRI	x		
		========	========	=======================================	======	=======	======
LAB CONTROL SPIKE				Solid	/Soil/S	ludge	
======================================	*********	*========		===== =====	===±===		******
ANALYTE	ANALYZED UNITS	METHOD	SPK	SPK RES	% REC	LIMITS	NOTES
Solids-Total Residue (TS)	09-28-99 wt %	CLP/CI	90	88.7	99		1

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values. See cover letter for additional information

10/19/99

^[1] Sample Preparation on 09-27-99 by JF

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092499A

Lab Name: Katahdin Analytical Services

SDG No.: WP4048

Lab File ID:

Z2167

Lab Sample ID: SBLK;092499A

Instrument ID:

5972-Z

Date Extracted: 9/24/99

GC Column: RTX-5

ID: 0.25 (mm) Date Analyzed: 09/28/99

Matrix: (soil/water) SOIL

Time Analyzed: 13:18

Level: (low/med)

LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092499A	LCS;092499A	Z2168	9/28/99	2:04:00 PM
36SLB010304	WP4048-3	Z2185	9/29/99	2:12:00 PM
36SLB010304MS	WP4048-3MS	Z2186	9/29/99	2:58:00 PM
36SLB010304MSD	WP4048-3MSD	Z2187	9/29/99	3:47:00 PM
36SLB010304D	WP4048-4	Z2188	9/29/99	4:35:00 PM



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client: Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Taliahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

SBLK;092499A

SDG: Report Date: WP4048 10/9/99

PO No. :

N7912-P99264

Project:

CTO #68

% Solids:

100

Method:

EPA 8270

Date Analyzed: 9/28/99

Sample Description	Matrix Sa	mpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092499A	SL	•	-	9/24/99	DPD	SW3550	KRT
Compound	Result	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<330	ug/Kg	1.0	330	330		
2-METHYLNAPHTHALENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHYLENE	<330	ug/Kg	1.0	330	330		
ACENAPHTHENE	<330	ug/Kg	1.0	330	330		
FLUORENE	<330	ug/Kg	1.0	330	330		
PHENANTHRENE	<330	ug/Kg	1.0	330	330		
ANTHRACENE	<330	ug/Kg	1.0	330	330		
FLUORANTHENE	<330	ug/Kg	1.0	330	330		
PYRENE	<330	ug/Kg	1.0	330	330		
BENZO[A]ANTHRACENE	<330	ug/Kg	1.0	330	330		
CHRYSENE	<330	ug/Kg	1.0	330	330		
BENZO[B]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO[K]FLUORANTHENE	<330	ug/Kg	1.0	330	330		
BENZO[A]PYRENE	<330	ug/ Kg	1.0	330	330		
INDENO[1,2,3-CD]PYRENE	<330	ug/Kg	1.0	330	330		
DIBENZ[A,H]ANTHRACENE	<330	ug/Kg	1.0	330	330		
BENZO[G,H,I]PERYLENE	<330	ид/Кд	1.0	330	330		
NITROBENZENE-D5	63	%	1.0				
2-FLUOROBIPHENYL	66	%	1.0				
TERPHENYL-D14	76	%	1.0				

Report Notes:

Katahdin Analytical Services 8270 LCS Recovery Sheet

Lab File: Z2168

Sample ID: LCS;092499A

Date Run: 9/28/99

Analyst: SW

Time Injected 2:04:00 PM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	1667	1150	69	60-140
ACENAPHTHENE	1667	1060	64	60-140
ACENAPHTHYLENE	1667	1200	72	60-140
ANTHRACENE	1667	1220	73	60-140
BENZO[A]ANTHRACENE	1667	1260	76	60-140
BENZO[A]PYRENE	1667	1200	72	60-140
BENZO[B]FLUORANTHENE	1667	1220	73	60-140
BENZO[G,H,I]PERYLENE	1667	1090	66	60-140
BENZO[K]FLUORANTHENE	1667	1160	70	60-140
CHRYSENE	1667	1230	74	60-140
DIBENZ[A,H]ANTHRACENE	1667	1130	68	60-140
FLUORANTHENE	1667	1340	81	60-140
FLUORENE	1667	1180	70	60-140
INDENO[1,2,3-CD]PYRENE	1667	1210	73	60-140
naphthalene	1667	1090	65	60-140
PHENANTHRENE	1667	1320	79	60-140
PYRENE	1667	1230	74	60-140

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKM28A

Lab Name: Katahdin Analytical Services

SDG No.: WP4048

Lab File ID:

M2034

Lab Sample ID: VBLKM28A

Date Analyzed: 09/28/99

Time Analyzed: 13:12

GC Column: RTX-624 ID: 0.18

(mm)

Heated Purge: (Y/N) Y

Instrument ID: 5972-M

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Tirne Injected
LCSM28C	LCSM28C	M2033	9/28/99	12:23:00 PM
36SLB010304	WP4048-3	M2039	9/28/99	4:57:00 PM
36SLB010304D	WP4048-4	M2040	9/28/99	5:38:00 PM



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKM28A

SDG: Report Date: WP4048 10/7/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

100

Method: Date Analyzed:

SW8260 9/28/99

Sample Description VBLKM28A Compound BENZENE TOLUENE 1,2-DIBROMOETHANE	Matrix	Sampled Date		Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst		
VBLKM28A	SL		-	<u>.</u>	9/28/99	нмР	5030	нмР		
Compound	Re	esult	Units	DF	Sample PQI	Method PQL				
		<5	ug/Kg	1.0	5	5	<u>-</u>			
TOLUENE		<5	ug/Kg	1.0	5	5				
1,2-DIBROMOETHANE		<5	ug/Kg	1.0	5	5				
ETHYLBENZENE		<5	ug/Kg	1.0	5	5				
NAPHTHALENE		J3	ug/Kg	1.0	5	5				
MTBE		<5	ug/Kg	1.0	5	5				
TOTAL XYLENES		<5	ug/Kg	1.0	5	5				
DIBROMOFLUOROMETHANE	1	122	- ·	1.0						
1,2-DICHLOROETHANE-D4	1	120	%	1.0						
DLUENE-D8	1	123	%	1.0						
P-BROMOFLUOROBENZENE	1	120	%	1.0						

___eport Notes:

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: M2033

Sample ID: LCSM28C

Date Run: 9/28/99

Analyst: HMP

Time Injected 12:23:00 PM

Matrix: SL

Compound Name	Spike Amt (ug/Kg)	Result (ug/Kg)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	55.6	111	60-140
BENZENE	50	54.9	110	60-140
ETHYLBENZENE	50	56.2	112	60-140
MTBE	50	55.1	110	60-140
NAPHTHALENE	50	51.8	104	60-140
TOLUENE	50	56.1	112	60-140
TOTAL XYLENES	150	166	111	60-140

CASE NARRATIVE

for

Katahdin Analytical Westbrook, ME Former Charleston Naval Complex Site SDG #99644S

October 18, 1999

Laboratory Identification:

General Engineering Laboratories, Inc. (GEL)

Mailing Address:

P.O. Box 30712 Charleston, SC 29417

Express Mail Delivery and Shipping Address:

2040 Savage Rd Charleston, SC 29414

<u>Telephone Number:</u>

(843) 556-8171

Summary:

Sample receipt

The samples from the former Charleston Naval Complex site arrived at General Engineering Laboratories, Inc., Charleston, SC on September 22, 1999, for environmental analyses. All sample containers arrived without any visible signs of tampering or breakage. The samples were delivered with chain of custody documentation and signatures.

The following samples were received by the laboratory:

Laboratory	Sample
<u>Identification</u>	Description
9909644-01	36SLB010304
9909644-02	36SLB010304D
9909644-03	36SLB120304
9909644-04	36SLB120304D
9909644-05	36SLB020405

GENERAL ENGINEERING LABORATORIES

PO Box 30712 • Charleston, SC 29417 • 2040 Savage Road • 29407

(803) 556-8171 • Fax (803) 766-1178



Case Narrative

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are listed below by analytical parameter.

Internal Chain of Custody:

Custody was maintained for all samples.

Data Package:

The enclosed data package contains the following sections: Case Narrative, Data Qualifier Definitions, Chain of Custody, Cooler Receipt Checklist, and General Chemistry Analysis.

The following are definitions of reporting limits used at General Engineering Laboratories:

Detection Limit: The minimum level of an analyte that can be determined (identified not quantified) with 99% confidence. The values are normally achieved by preparing and analyzing seven aliquots of laboratory water spiked 1 to 5 times the estimated MDL, taking the standard deviation and multiplying it against the one-tailed t-statistic at 99%. This computed value is then verified for reasonableness by repeating the study using the concentration found in the initial study, calculating an F-ratio, and computing the final limit. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The detection limit is the minimum concentration of a substance that can be identified, measured, and reported with 99% confidence that the analyte concentration is above zero. It answers the question "Is It Present."

QL Quantitation Limit: The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. The QL is generally 5 to 10 times the MDL. However, it may be nominally chosen within these guidelines to simplify data reporting. For many analytes the QL analyte concentration is selected as the lowest non-zero standard in the calibration curve.

Sample QL's are highly matrix-dependent. Sample specific preparation and dilution factors are applied to these limits when they are reported.

The QL is always \geq DL.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.

Valerie S. Davis Project Manager

fc:kata9909644%

General Engineering Laboratories. Inc.

DATA QUALIFIERS FOR INORGANIC ANALYSES

Data Qualifiers used on Form 1s or Certificates of Analysis (C Of A) follow the specifications set forth in the technical specifications of the most current CLP Statement of Work and are defined as follows

Section	Explanation	Location
E .	The qualifier that is used when the percent difference between the parent sample and its serial dilution's concentrations exceeds 10%. The sample's concentration must be greater than 50 times the IDL/MDL for ICP (6010B/ILMO 3.0) or 100 times the absolute value of the preparation blank's concentration (6020). However, if analyzing ILMO 4.0 (ICP-MS), the parent sample's concentration must be 20 times the CRDL before the "E" flag is applied.	Form 1. and EDD
+	The qualifier that is used to indicate that the duplicate sample analysis for an analyte is out of control.	Form 1, and EDD
÷	Correlation coefficient the Method of Standard Addition (MSA) is less than 0.095.	Form 2, and EDD
В	The qualifier is used to indicate that the reported result fell above the IDL/MDL but below the CRDL.	Form 1. and EDD
M	The qualifier is used to indicate that the replicate injection readings of the GFAA sample analysis do not agree within 20% relative standard deviation (RSD) or coefficient of variation (CV).	Form 1, and EDD
N	This qualifier is used to indicate that the matrix or pre-digested spike sample recovery for an analyte is not within the specified control limit.	Form i, and EDD
S	The reported value was determined by the Method of Standard Addition (MSA).	Form 1. and EDD
Մ 	The analyte's result was less than the IDL/MDL.	C of A, Form 1. and EDD
W	Post-digestion spike for GFAA analysis is out of control limits (85%-115%), while sample results are less than 50% of the spike absorbance.	EDD, and Form 5, part 2
X	Other reporting flag as defined in report narrative.	Form 1, and EDD
**	This qualifier is used to indicate that the Laboratory Control Sample (LCS) recovery for an analyte is outside of the specified limits.	QC Summary Report

All surrogate recoveries and acceptance ranges are reported at the bottom of Form 2 or C of A. Any recoveries falling outside the acceptance range will be flagged with a **.

All flags do not apply to QC Summary and Certificate of Analysis packages.

CHAIN OF CUSTODY RECORD

General Engineering Labor	es, Inc.
2040 Savage Road	
Charleston, South Carolina 2.	- 407
P.O. Box 30712	
Charleston, South Carolina 29	9417
(803) 556-8171	

Client Na	me/Facility Na	me			_			SAM	PLE A	NAL'	YSIS F	EQUI	RED ((x) - US	e remar	ks area	to spec	ify spec	ific con	pound	s of met	hods		Us	e F or P in the boxes to indicate wheth	wer
1.1.1	A. JCh	refer ton	Your & C	, ,	1/2	8	μ.		\Box	Ļ.	Ш	Ш		LL.		\perp		LI			Ш	Ц	\perp	4	sample was littered and/or preserved	
Collected	by/Company	I-T 1	+ / 4	<u>, , , , , , , , , , , , , , , , , , , </u>	,	LAINE	tivity			booride		cify lufred	specify			- T	Acid Extractables	tebles			specify					
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White = sample collector

Page of ___

Yellow = file

Pink = with report

FEDERAL SAMPLE RECEIPT REVIEW Received by 79/13 GEL COOLER___ GEL POLY COOLER___ CLIENT COOLER___ OTHER SAMPLE REVIEW CRITERIA COMMENTS/QUALIFIERS YES NO Were shipping containers received intact and sealed? If no. notify Project Manager Was the Shipment screened following the radiochemistry survey procedure (EPI SOP S-007)? Were the survey results negative? If no. notify Project Manager Are any of the samples identified by the client as radioactive? If yes, did client provide RAD activity? 3. Were chain of custody documents included? Were chain of custody documents completed correctly? (Ink. signed, match containers) **5**. Were all sample containers properly labeled? Were proper sample containers received? 7. Preserved samples checked for pH? Were samples preserved correctly? If no, list samples & tests Shipping container temperature checked? Was shipping constiner temperature within specifications (4°± 2° C) If no. notify Project Manager Is temperature documented on the Chain of Custody? Were samples received within holding time? if No. notify Project Manger 13. Were VOA vinls free of headspace? 14. ARCOC# IF REQUIRED SDG# IF REQUIRED

REVIEW 9-9- DATE 9- 22.99 (SA) SEALS ATTACHED MSA - NO SEALS ATTACHED

Case Narrative for KATA SDG# 99644S

TOTAL PETROLEUM HYDROCARBONS

Analytical Batch Number: 159321

Analytical Method: SW846 9071A

Laboratory Number	Sample Description	
9909644-01	36SLB010304	
9909644-02	36SLB010304D	
9909644-05	36SLB020405	
9909644-06	36SLB050405	
9909644-07	36SLB030405	
QC652076	Blank	
QC652077	Laboratory Control Sample	
OC652078	Matrix Spike of 9909644-02	
QC652079	Duplicate of 9909644-02	

Sample Preparation:

All samples were prepared in accordance with accepted procedures.

Instrument Calibration:

The instrument was properly calibrated.

Holding Time:

All samples were analyzed within the required holding time.

Blanks:

No target analytes were detected in the method blank above the required acceptance limit,

Spike Analyses:

The matrix spike was run on the following Sample Number.

9909644-02

All analyte recoveries in the matrix spike were within the required acceptance limits.

Laboratory Control Samples:

All analyte recoveries in the laboratory control sample were within the required acceptance limits.

Sample Duplicates:

All sample duplicate results were within the required acceptance limits.

Dilutions:

None of the samples were diluted.

Non Conformance Reports:

There were no Nonconformance Reports associated with this batch.

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 07, 1999

: 36SLB010304D

Page I of !

Sample ID

Lab ID

: 9909644-02

Matrix

: Soil

Date Collected

: 09/22/99

Date Received

: 09/22/99

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	rst Date	Time	Batch 1	M
General Chemistry	7		Ī								
Total Rec. Petro. F	lydrocarbons	577	139	278	mg/kg	1.0	AAT	09/30/99	1140	159321	1
Evaporative Loss	₱ 105 C	28.0	1.00	1.00	wt%	1.0	GJ	09/24/99	1445	159010	2

M = Method	Method	Description
M 1	SW846	9071A
M 2	EPA 3	550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 07, 1999

Page 1 of 1

Sample ID Lab ID Matrix : 36SLB010304 : 9909644-01 : Soil

Matrix
Date Collected
Date Received

: 09/22/99 : 09/22/99

Priority Callector : Routine : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	yst Date	Time	Batch M	A
General Chemistr	•				_						
Total Rec. Petro. I	lydrocarbons J	181	145	290	mg/kg	1.0	AAT	09/30/99	1140	159321	1
Evaporative Loss	@ 105 C	31.0	1.00	1.00	wt%	1.0	GI	09/24/99	1445	159010	2

M = Method	Method-Description	
MI	SW846 9071A	
M 2	EPA 3550	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

* indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Jack 41. W

Reviewed By

| ION IN IN THE BRIEN IN IN THE TOTAL IN IN

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

œ: KATA00199

Report Date: October 07, 1999

Page 1 of 1

Sample ID

Lab ID

: 36SLB120304 : 9909644-03

Matrix

: Soil

Date Collected

: 09/22/99

Date Received

: 09/22/99

Priority

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Anal	yst Date	Time	Batch	M
General Chemistr										•	
Evaporative Loss	@ 105 C	10.0	1.00	1.00	₩t%	1.0	GJ	09/24/99	1445	159010	0 1
Total Organic Car	nbon	1040	43.1	100	mg/kg	1.0	JB1	09/30/99	1316	159373	32

M = Method	Method-Description	
м1	EPA 3550	
M 2	SW846 9060 Modified	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Jen 9 A

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 07, 1999

Page 1 of 1

Sample ID Lab ID : 36SLB120304D : 9909644-04

Matrix

: Soil

Date Collected

: 09/22/99

Date Received

: 09/22/99

Priority

: (19/22/9) : Routine

Collector

: Client

Parameter	Qualifler	Result	DL	RL	Units	DF	Analy	st Date	Time	Batch	M
General Chemistry	y				<u></u>			_			
Evaporative Loss	@ 105 C	9.00	1.00	1.00	wt%	1.0	GJ	09/24/99	1445	159010	1
Total Organic Carl	bon	2840	43.1	100	mg/kg	1.0	JB1	09/30/99	1356	159373	2

M = Method	Method-Description	
M 1	EPA 3550	
M 2	SW846 9060 Modified	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Jed 9 W

Reviewed By

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 07, 1999

Page 1 of 1

Sample ID Lab ID

: 36SLB020405 : 9909644-05

Matrix

: Soil

Date Collected Date Received

: 09/21/99

Priority

: 09/22/99

: Routine

Collector

: Client

Parameter	Qualifier	Result	DL	RL	Upits	DF	Analy	st Date	Time	Batch	M
General Chemistry Total Rec. Petro, H		442	128	256		1.0	AAT	09/30/99	1140	150201	,
Evaporative Loss @	•	22.0	1.00	1.00	mg/kg wt%			09/24/99			-

M = Method	Method-Description
M 1	SW846 9071A
M 2	EPA 3550

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

J indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Jan 9. U

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Reviewed By

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 07, 1999

Page 1 of 1

Sample ID

: 36SLB050405

Lab ID Matrix

: 9909644-06

Date Collected

: Soil : 09/22/99

Date Received

: 09/22/99

Priority Collector : Routine : Client

Parameter	Qualifier	Result	DL	RL	Units	DF	Analy	st Date	Time	Batch	M
General Chemistr	y									_	
Total Rec. Petro. 1	Hydrocarbons	878	135	270	mg/kg	1.0	AAT	09/30/99	1140	159321	1 1
Evaporative Loss	@ 105 C	26.0	1.00	1.00	wt%	1.0	GJ	09/24/99	1445	159010	2 (

M = Method	Method-Description	
M 1	SW846 9071A	
M 2	EPA 3550	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Jana M

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (843) 769-7391.

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

Katahdin Analytical

340 County Road

Westbrook, Maine 04092

Contact:

Ms. Andrea Colby

Project Description:

Former Naval Complex

cc: KATA00199

Report Date: October 07, 1999

Page 1 of 1

Sample ID

: 36SLB030405 : 9909644-07

Lab ID Matrix

: Soil

Date Collected Date Received

: 09/22/99 : 09/22/99

Priority

: Routine

Co	liector	: Client

Parameter	Qualifier	Result	DL	RL_	Units	DF	Analy	nst Date	Time	Batch M
General Chemistry										
Total Rec. Petro. Hydr	rocarbons	540	135	270	mg/kg	1.0	AAT	09/30/99	1140	159321 1
Evaporative Loss @ 1	05 C	26.0	1.00	1,00	wt%	1.0	GJ	09/24/99]445	159010 2

M ≈ Method	Method-Description	
M 1	SW846 9071 A	_
M 2	EPA 3550	

Notes:

The qualifiers in this report are defined as follows:

ND indicates that the analyte was not detected at a concentration greater than the detection limit.

I indicates presence of analyte at a concentration less than the reporting limit (RL) and greater than the detection limit (DL).

U indicates that the analyte was not detected at a concentration greater than the detection limit.

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (843) 769-7391.

Jan 9. 1

^{*} indicates that a quality control analyte recovery is outside of specified acceptance criteria.

QC Summary Report

Project Description:

Former Naval Complex

c: KATA00199

Lab. Sample ID: 9909644%

Report Date: October 07, 1999

Page 1 of 1

Sample/Parame	eter Type	Batch	NOM	Sample	Qual QC	Units	RPD%	REC%	Range A	malyst	Date	Time
General Chemis	stry											
QC652076	BLANK	159321										
Total Rec. Petr	ro. Hydrocarbons				90.0	mg/kg				LAA	09/30/99	1140
QC652079	9909644-02DUP	159321										
Total Rec. Petr	ro. Hydrocarbons			576	451	mg/kg	24.3					
QC652077	LC\$	159321										
Total Rec. Petr	ro. Hydrocarbons		10800		7550	mg/kg		70.1	(70.0 - 116.))		
QC652078	9909644-02MS	159321										
Total Rec. Petr	ro. Hydrocarbons		17100	576	14400	mg/kg		80.6	(70.0 - 130.))		
QC650825	BLANK	159010										
Evaporative Lo	oss @ 105 C				0.00	wt%				GJ	09/24/99	1445
QC650823	9909644-02DUP	159010										
Evaporative Lo	oss @ 105 C			28.0	27.0	wt%	3.64					
QC650824	9909644-04DUP	159010										
Evaporative Lo	oss @ 105 C			9.00	10.0	₩t%	10.5					
QC652303	BLANK	159373										
Total Organic	Carbon				5.80	mg/kg				JB1	09/30/99	1242
QC652305	9909644-04DUP	159373										
Total Organic	Carbon			2840	2960	mg/kg	4.07			Љ 1	09/30/99	1403
QC652304	LCS	159373										
Total Organic	Carbon		4000		4660	mg/kg		117	(88.0 - 130.) JB1	09/30/99	1249
QC652306	9909644-04PS	159373				_						
Total Organic	Carbon		9410	2840	11800	mg/kg		94.6	(73.0 - 129.) ЈВ1	09/30/99	1410

Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte < RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

n/a indicates that spike recovery limits do not apply when sample concentration exceeds spike cone by a factor of 4 or more

•	S-34 WP 4075-33	ii mendebidi V P									
								2000			
	S-34 WP 4075-33	12.70	0,09	0.061	0.0175	1.7		46.6	46.3	5.4	
-		Project Kata	hđin Analytic	al Services	1	ocation	Westl	prook, M	aine		
S.W.COLE ENGINEERING, INC.		SWC Job No. 99-812 Date October 5, 1999				Sheet No. 2 GRADATION CURVES					



September 23, 1999

Mr. Paul Calligan

Tetra Tech Nus

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

RE: Katahdin Lab Number:

WP3647

Project ID:

CNC Charleston

Project Manager:

Ms. Andrea J.Colby

Sample Receipt Date(s):

8/17/99

Dear Mr. Calligan:

Please find enclosed the following information:

- * Report of Analysis
- **Quality Control Data Summary**
- Chain of Custody
- Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Raw lab Data Zoe I Sile 36

KATAHDI ANALYTICAL SERVICES, SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400 Fax (207) 775-4029		٠.	*	LAB (WORK ORDER) # W \$ 3 6 4 7 PAGE: OF COOLER: OF
PROJECT: CNC Charlest	- - -	-		COC# — SDG# — DATE / TIME RECEIVED: OB 1799 (100 DELIVERED BY: FEDEX RECEIVED BY: SAW LIMS ENTRY BY: SAW LIMS REVIEW BY / PM: KOL
	YES	NO	EXCEPTIONS	COMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?				
2:CHAIN OF CUSTODY PRESENT IN THIS COOLER?				· · · · · · · · · · · · · · · · · · ·
3. CHAIN OF CUSTODY SIGNED BY CLIENT?		<u> </u>		
4. CHAIN OF CUSTODY MATCHES SAMPLES?				De notified Paul Callis
5. TEMPERATURE BLANKS PRESENT?				TEMP BLANK TEMP (°C)= 1.0 by for 8/17/99
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (F) or N?				COOLER TEMP (*C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?				
8. TRIP BLANK PRESENT IN THIS COOLER	Ū,			
9. PROPER SAMPLE CONTAINERS AND VOLUME?				
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	\mathbf{Q}^{\star}			<u> </u>
11. SAMPLES PROPERLY PRESERVED(1)?	V			<u> </u>
12. CORRECTIVE ACTION REPORT FILED?			N/A	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMME	RCIAL (CLP HA	ZWRAP NFESC ACC	E AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES(1):		•		

Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH edjustment, record volume and type of preservetive added.

- AVA atandin Workersh ME 04008

CHAIN OF COSTODY

Address NHZ Aue H City N. Charleston State Sc Zip Code ZG405 Purchase Order # Proj. Name / No. Katahdin Quote # Bill (if different than above) Address Sampler (Print / Sign) Copies To: LAB USE ONLY WORK ORDER #: WP3447 -	ANALYTICAL SERVICES Tel: (20	17) 874-2400 07) 775-4029				PLEASE	PRINT	IN PEN		Pag	је	of
Cope Proj. Name / No. No	Client Tetra Tech	NUS	Contact Brass	How				465		(#		
Proj. Name / No. Address Sampler (Print / Sign) LAB USE ONLY KATAHON PROJECT MANAGER REMARKS SHIPPING INFO ARBILL NO. 813440 29 04484 TEMPC 24GL M Ø3 Ø1 /1134	Address NHZI Au		V. Che	doct			Sc			294	t05	
Sampler (Print / Sign)	Purchase Order #	Proj. Name / N	ło.	<u> </u>			j					_
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Table Only RATA-DIN PROJECT MANAGER W 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Sampler (Print / Sign)						Copies	То:				
REMARKS SHIPPING INFO. AFED EX	LAB USE ONLI	WY3641 -				P	RESERV	ATIVES				
ShipPinG INFO: AFED EX UPS CLENT ARBILL NO. 8/3/4/029/04/8/4 TEMP'C OTEMP BLANK INTRCT NOT INTRCT Sample Description Date / Time Matrix No. of Coltra VI VI VI VI VI VI VI V		DIECT MANAGER		ilt. Filt.	1 1	DYDN		Filt. JY□N		OY □ N	Fift. □Y□N	Filt.
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36GLmd101		,	6	3 2	i			_				
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21GLM0561 1/44/1244 W S 3 Z 24TL 002 0 1	3666680-004	1754 W	5	3 2								
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3/16/19 8/134/029/044/84 017.99 1100 8/1.00 slighille	COMMENTS											
3/16/19 8/134/029/044/84 017.99 1100 8/1.00 slighille	Relinquished By: (Signature)	e / Time Received By: (S	Signature)	. Relinquis	hed By: (Signature) Dat	e / Tir	ne F	Received	Ву: (Sigr	ngiture)
	Just 1/16/	kg 813402	9044	84			_ 8-17) 1		لمكينيا	

PRMSOURCE INC. TO (207) 782-3311 PRM & CHN-OF-CSTDY

New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 1

Project Manager: Andrea J. Colby ORDER NO WP-3647 ORDER DATE: 08/17/99 ORT TO: Paul Calligan PHONE: 850/385-9899 Tetra Tech NUS FAX: 850/385-9860 1401 Oven Park Dr., Suite 102 DUE: 16 SEP Tallahassee, FL 32308 FAC.ID: CNC CHARLESTON ACCOUNTS PAYABLE PHONE: 412/921-7090 INVOICE: TETRA TECH NUS, INC. PO: N7912-P99264 FOSTER PLAZA 7, 661 ANDERSEN DR. PITTSBURGH, PA 15220 PROJECT: CTO #68 SAMPLED BY: CLIENT DELIVERED BY: FED EX DISPOSE: AFTER 16 OCT SAMPLED DATE/TIME ITEM LOG NUMBER SAMPLE DESCRIPTION RECEIVED MATRIX WP3647-1 24GLM0101 13 AUG 1135 17 AUG 1 AO. 13 AUG 1136 WP3647-2 24GLM0201 13 AUG 1137 WP3647-3 24GLM0301 OTY DETERMINATION METHOD PRICE TRUOMA Target Analyte List Metals, Total 3 100.00 300.00 TPH Subcontract 3 55.00 165.00 TOTALS 155.00 465.00 SAMPLED DATE/TIME RECEIVED LOG NUMBER SAMPLE DESCRIPTION MATRIX WP3647-4 24GLM0401 13 AUG 1151 17 AUG AO DETERMINATION METHOD OTY PRICE TUUOMA Target Analyte List Metals, Total 1 100.)0 100.00 Volatile Organics by 8260B SW8260 1 75.UO 75.00 Polynuclear Aromatic Hydrocarbons EPA 8270 1 125.00 125.00 TPH Subcontract 55.00 55.00 1 TOTALS 355.00 355.00 LOG NUMBER SAMPLE DESCRIPTION SAMPLED DATE/TIME RECEIVED MATRIX 16 AUG 1752 WP3647-5 36GLM0101 17 AUG AO 16 AUG 1754 WP3647-6 36GL680-004 WP3647-7 21GLM0501 16 AUG 1240 DETERMINATION METHOD OTY PRICE AMOUNT

Polynuclear Aromatic Hydrocarbons

Volatile Organics by 8260B

TOTALS

EPA 8270

SW8260

3

3

3

125.00

200.00

75.00

375.00

225.00

600.00

KATAHDIN ANALYTICAL SERVICES, INCORPORATED New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 2

ORDER NO WP-3647

Project Manager: Andrea J. Colby

ORDER DATE: 08/17/99

REPORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PHONE: 850/385-98

FAX: 850/385-9860

DUE: 16 SEP

FAC.ID: CNC CHARLESTON

PHONE: 412/921-7090

INVOICE:

ACCOUNTS PAYABLE

TETRA TECH NUS, INC.

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220

PROJECT: CTO #68

PO: N7912-P99264

SAMPLED BY: CLIENT

DELIVERED BY: FED EX

DISPOSE: AFTER 16 OCT

LOG NUMBER SAMPLE DESCRIPTION WP3647-8

24TL00201

SAMPLED DATE/TIME RECEIVED 16 AUG

17 AUG

MATRIX AO

DETERMINATION

METHOD

Volatile Organics by 8260B

SW8260

PRICE 75.00 AMOUNT 75.00

ORDER NOTE:

QC-II+ NFESC

DD (KAS007QC-DB3)

CNC CHARLESTON

REPORT COPY: MS. LEE LECK

TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR. PITTSBURG, PA 15220

REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT

\$1,495.0 This is NOT an Invoice

AJC/BKR/WEST.AJC(dw)

08-24Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note

Note Text

J

'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3647-5

SDG:

WP3647

Report Date: PO No.:

9/23/99 N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/2/99

Sample Description	Matrix S	ampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0101	PA	8/16/99	8/17/99	8/20/99	DS	SW3510	KRT
Compound	Resu	lt Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	53	ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10		
ACENAPHTHYLENE	<10	ug/L	1.0	10	10		
ACENAPHTHENE	<10	ug/L	1.0	10	10		
FLUORENE	<10	ug/L	1.0	10	10		
PHENANTHRENE	<10	ug/L	1.0	10	10		
ANTHRACENE	<10	ug/L	1.0	10	10		
FLUORANTHENE	<10	ug/L	1.0	10	10		
PYRENE	<10	ug/L	1.0	10	10		
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10		
CHRYSENE	<10	ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10		
BÉNZO[A]PYRENE	<10	ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10		
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10		
NITROSENZENE-D5	54	%	1.0				
2-FLUOROBIPHENYL	66	%	1.0				
TERPHENYL-D14	46	%	1.0				

Report Notes:



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3647-5

SDG:

WP3647 9/23/99

Report Date: PO No.:

N7912-P99264

Project:

CTO#68

% Solids:

N/A

Method: Date Analyzed: 8/21/99

SW8260

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0101	PΑ	8/16/99	8/17/99	8/21/99	HMP	5030	HMP
Compound	Re	sult Units	DF	Sample PQL	Method PQL		
BENZENE	J	4 ug/L	1.0	5	5		
TOLUENE	3	5 ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<	5 ug/L	1.0	5	5		
ETHYLBENZENE	1	3 ug/L	1.0	5	5		
NAPHTHALENE	1'	10 ug/L	1.0	5	5		
MTBE	<	5 ug/L	1.0	5	5		
TOTAL XYLENES	6	2 ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE	8	e %	1.0				
1,2-DICHLOROETHANE-D4	7	8 %	1.0				
DLUENE-D8	9	7 %	1.0				
BROMOFLUOROBENZENE	9	8 %	1.0				

port Notes:



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3647-6

SDG:

WP3647

Report Date: PO No.:

9/23/99 N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/2/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GL680-004	AQ	8/16/99	8/17/99	8/20/99	Ds	SW3510	KRT
Compound	Res	ult Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<1	0 ug/L	1.0	10	10		-
2-METHYLNAPHTHALENE	<1	0 ug/L	1.0	10	10		
ACENAPHTHYLENE	<1	0 ug/L	1.0	10	10		
ACENAPHTHENE	<1	0 ug/L	1.0	10	10		
FLUORENE	<1	0 ug/L	1.0	10	10		
PHENANTHRENE	<1	0 ug/L	1.0	10	10		
ANTHRACENE	<1	0 ug/L	1.0	10	10		
FLUORANTHENE	<1	0 ug/L	1.0	10	10		
PYRENE	<1	0 ug/L	1.0	10	10		
BENZO(A)ANTHRACENE	<10	0 ug/L	1.0	10	10		
CHRYSENE	<1	0 ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10	0 ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<16	D ug/L	1.0	10	10		
BENZO[A]PYRENE	<10	O ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<16	D ug/L	1.0	10	10		
DIBENZJA,HJANTHRACENE	<10	O ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<16	O ug/L	1.0	10	10		
NITROBENZENE-D5	59	%	1.0				
2-FLUOROBIPHENYL	64	%	1.0				
TERPHENYL-D14	65	96	1.0				

Report Notes:



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3647-6

SDG:

WP3647 9/23/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed:

8/21/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GL680-004	AQ	8/16/99	8/17/99	8/21/99	НМР	5030	НМР

36GL680-004	AQ (3/16/99	8/17/99	8/21/99	НМР	5030	HMP
Compound	Resuit	Units	DF	Sample PQL	Method P <u>QL</u>		
BENZENE	<5	ug/L	1.0	5	5		
TOLUENE	<5	ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5		
ETHYLBENZENE	<5	ug/L	1.0	5	5		
NAPHTHALENE	<5	ug/L	1.0	5	5		
MTBE	<5	ug/L	1.0	5	5		
TOTAL XYLENES	<5	ug/L	1.0	5	5		
DIBROMOFLUOROMETHÂNE	95	%	1.0				
1,2-DICHLOROETHANE-D4	90	%	1.0				
CONTRACTOR CONTRACTOR	104	%	1.0				
""-BROMOFLUOROBENZENE	101	%	1.0				

port Notes:

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;082099

Lab Name: Katahdin Analytical Services

SDG No.: WP3647

Lab File ID:

K2034

Lab Sample ID: SBLK;082099

Instrument ID:

5970-K

Date Extracted: 8/20/99

GC Column: RTX-5

ID: 0.25 (mm) Date Analyzed: 09/02/99

Matrix: (soil/water) WATER

Time Analyzed: 12:22

Level: (low/med)

LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	<u>Lab</u> Data File	Date Injected	Time Injected
LCS;082099	LCS;082099	K2035	9/2/99	1:04:00 PM
24GLM0401	WP3647-4	K2036	9/2/99	1:47:00 PM
36GLM0101	WP3647-5	K2037	9/2/99	2:29:00 PM
36GL680-004	WP3647-6	K2038	9/2/99	3:11:00 PM
21GLM0501	WP3647-7	K2039	9/2/99	3:54:00 PM



∩lient:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

SBLK;082099

SDG:

WP3647

Report Date:

9/23/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/2/99

Sample Description	Matrix S	ampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;082099	AQ	-	-	8/20/99	DS	SW3510	KRT
Compound	Resul	lt Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<10	ш g/L	1,0	10	10		
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10		
ACENAPHTHYLENE	<10	ug/L	1.0	10	10		
ACENAPHTHENE	<10	u g/ L	1.0	10	10		
FLUORENE	<10	ug/L	1.0	10	10		
PHENANTHRENE	<10	ug/L	1.0	10	10		
ANTHRACENE	<10	ug/L	1.0	10	10		
FLUORANTHENE	<10	ug/L	1.0	10	10		
?YRENE	<10	ug/L	1.0	10	10		
INZO[A]ANTHRACENE	<10	ug/L	1.0	10	10		
ČHRYSENE	<10	ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO[A]PYRENE	<10	υ g/ L	1.0	10	10		-
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10		
DIBENZ[A H]ANTHRACENE	<10	υg/L	1.0	10	10		
BENZOIG,H,IJPERYLENE	<10	ug/L	1.0	10	10		
NITROBENZENE-D5	65	%	1.0				
2-FLUOROBIPHENYL	69	%	1.0				
TERPHENYL-D14	71	%	1.0				

--- «eporl Notes:

Katahdin Analytical Services 8270 LCS Recovery Sheet

Lab File: K2035

Sample ID: LCS;082099

Date Run: 9/2/99

Analyst: KRT

Time Injected 1:04:00 PM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	38.5	77	70-130
ACENAPHTHENE	50	42.9	86	70-130
ACENAPHTHYLENE	50	43.5	87	70-130
ANTHRACENE	50	49.0	98	70-130
BENZO[A]ANTHRACENE	50	44.1	88	70-130
BENZO(A)PYRËNE	50	48.0 96		70-130
BENZO[B]FLUORANTHENE	50	47.8	96	70-130
BENZO[G,H,I]PERYLENE	50	39.8	80	70-130
BENZO[K]FLUORANTHENE	50	51.4	103	70-130
CHRYSENE	50	47.7	95	70-130
DIBENZ[A,H]ANTHRACENE	50	43.2	86	70-130
FLUORANTHENE	50	52.4	105	70-130
FLUORENE	50	46.6	93	70-130
INDENO[1,2,3-CD]PYRENE	50	40.4	81	70-130
NAPHTHALENE	50	43.0	86	70-130
PHENANTHRENE	50	51.3	102	70-130
PYRENE	50	47,0	94	70-130

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ21A

Lab Name: Katahdin Analytical Services

SDG No.: WP3647

Lab File ID:

Q6419

Lab Sample ID: VBLKQ21A

Date Analyzed: 08/21/99

Time Analyzed: 11:20

GC Column: RTX-502 ID: 0.53

(mm)

Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ21A	LCSQ21A	Q6418	8/21/99	10:28:00 AM
24GLM0401	WP3647-4	Q6420	8/21/99	12:28:00 PM
36GLM0101	WP3647-5	Q6421	8/21/99	1:22:00 PM
36GL680-004	WP3647-6	Q6423	8/21/99	2:39:00 PM
21 GLM0501	WP3647-7	Q6426	8/21/99	4:36:00 PM
24TL00201	WP3647-8	Q6431	8/21/99	7:49:00 PM



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

1,2-DICHLOROETHANE-D4

P-BROMOFLUOROBENZENE

TOLUENE-D8

91

102

102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKQ21A

SDG:

WP3647

Report Date:

9/23/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method: Date Analyzed: SW8260 8/21/99

Sample Description	Matrix	Sampled Date		Sampled Date		Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ21A	AQ	-		-	8/21/99	HMP	5030	НМР		
Compound	Re	esult	Units	DF	Sample PQL	Mathod PQL				
BENZENE		<5 L	ıg/L	1.0	5	5				
TOLUENE		<5 u	ıg/L	1.0	5	5				
1,2-DIBROMOETHANE		<5 u	ıg/L	1.0	5	5				
ETHYLBENZENE		<5 u	ıg/L	1.0	5	5				
NAPHTHALENE		<5 ι	ıg/L	1.0	5	5				
MTBE		<5 ι	ıg/L	1.0	5	5				
TOTAL XYLENES		<5 u	ıg/L	1.0	5	5				
DIBROMOFLUOROMETHANE	•	95	%	1.0						

1.0

1.0

1.0

Report Notes:

CLIENT: Paul Calligan

Tetra Tech MUS

1401 Oven Park Dr., Suite 192 Tallahassee, FL 32308 PROJECT: CTO #48

V4.TE-TV

Analyzed: 08-21-99
Analyzed by:HMP
Method: SW8260

REPORT OF LABORATORY METHOD BLANK RESULTS

MATRIX						
Aqueous						
F O L ug/L	RESULT ug/L	NOTES				
5.	<5.					
5.	(5.					
5.	(5.					
5.	(5.					
5.	⟨5.					
5.	(5.					
5.	(5.					
	95.					
	91.					
	192.					
	102.					
	Aqueous FOL ug/L 5. 5. 5. 5.	FOL RESULT ug/L 5. (5. 5. (5. 5. (5. 5. (5. 5. (5. 5. (5. 95. 91. 102.				

^{*} PQL (Practical Guantitation Level) represents laboratory reporting limits and may not reflect sample—specific reporting limits. Sample—specific limits are indicated by results annotated with '(' values.

39/23/99

HETHOD BLANK GO Batch ID: PH21VOW2

Lab Number: WP3647-4

Katahdin Analytical Services **8260 LCS Recovery Sheet**

Lab File: Q6418

Sample ID: LCSQ21A

Date Run: 8/21/99

Analyst: HMP

Time Injected 10:28:00 AM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	52,2	104	60-140
BENZENE	50	50,2	100	60-140
ETHYLBENZENE	50	47.0	94	60-140
MTBE	50	40.8	82	60-140
NAPHTHALENE	50	39.5	79	60-140
TOLUENE	50	49.9	100	60-140
TOTAL XYLENES	150	135	90	60-140



October 13, 1999

Mr. Paul Calligan

Tetra Tech Nus

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

RE: Katahdin Lab Number:

WP3906

Project ID:

CNC Charleston

Project Manager:

Ms. Andrea J.Colby

Sample Receipt Date(s):

9/14/99

Dear Mr. Calligan:

Please find enclosed the following information:

- Report of Analysis
- * Quality Control Data Summary
- Chain of Custody
- Confirmation

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact the project manager listed above. This cover letter is an integral part of the ROA.

We appreciate your continued use of our laboratory and look forward to working with you in the future. The following signature indicates technical review and acceptance of the data.

Sincerely,

KATAHDIN ANALYTICAL SERVICES

Authorized Signature

10/13/99 Date



SDG NARRATIVE KATAHDIN ANALYTICAL SERVICES TETRA TECH NUS CASE CNC CHARLESTON

Sample Receipt

The following samples were received on September 14, 1999 and were logged in under Katahdin Analytical Services work order number WP3906 for a hardcopy due date of October 14, 1999.

Tr a CO A TURNED I	7775 T 10
KATAHDIN	TTNUS
Sample No.	Sample Identification
WP3906-1	36GLM0101
WP3906-2	36GLO680004
WP3906-3	36GLM0701
WP3906-4	36GLM0401
WP3906-5	36GLM0501
WP3906-6	42GLM0401
WP3906-7	42GLM0301
WP3906-8	42GLM0201
WP3906-9	42GLM0501
WP3906-10	42GLM1401
WP3906-11	42GLM1701
WP3906-12	42GLM1501
WP3906-13	42GLM1601
WP3906-14	36GLM0201D
WP3906-15	22GLM0101
WP3906-16	22GLM0201
WP3906-17	22GLM0501
WP3906-18	22GLM0701
WP3906-19	42GLM1001
WP3906-20	42GLM1201
WP3906-21	42GLM0801
WP3906-22	42GLM0601
WP3906-23	42GLM0701D
WP3906-24	42GLM0101D
WP3906-25	42GLM1801
WP3906-26	42TL00101
WP3906-27	23TL00201
WP3906-28	36GLM0601
WP3906-29	36GLM0201
WP3906-30	36GLM0301
WP3906-31	42GLM0701
WP3906-32	42GLM0901
WP3906-33	42GLM1101
WP3906-34	42GLM1101 42GLM0101
₩ F J 700-34	42ODMUIUI



WP3906-35	42GLM1301
WP3906-36	23GLM0401
WP3906-37	23GLX0301
WP3906-38	23GLX0401
WP3906-39	23GLX0401D
WP3906-40	23GLM05D01
WP3906-41	23GLM0101
WP3906-42	25GLM0301
WP3906-43	25GLM0801
WP3906-44	25GLM0601
WP3906-45	25GLM0401
WP3906-46	25GLM0701
WP3906-47	16GLM7D01
WP3906-48	26GLP1201
WP3906-49	26GLP1301

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Volatile Organic Analysis

Forty-seven aqueous samples were received by the Katahdin Analytical Services, Inc. GC/MS laboratory on September 14, 1999 and were specified to be analyzed by USEPA method 8260B for the analytes benzene, toluene, ethylbenzene, xylenes, MTBE, naphthalene, and EDB.

Analyses for this workorder were performed on the 5973-U and 5970-Q instruments. A VSTD050 (50 ppb standard) was used for the continuing calibration standard. Internal standard and surrogate compounds were also spiked at 50 ppb.

Batch QC (VBLK, and LCS) was performed in each twelve-hour window. Results are included in this data package. The LCS QC samples were spiked with the entire list of compounds quantitated for at 50 ppb. Matrix spike/matrix spike duplicate analyses were performed on samples WP3906-5, -17, and -19.

Analyses of samples WP3906-10, -11, and -13 yielded concentrations of 1,2-dichloroethene (cis) over the upper limit of the calibration curve. Since this was not a requested analyte to be reported by the client, no laboratory action was taken.

Analysis of sample WP3906-19 was performed at a 1:5 dilution due to naphthalene concentrations, resulting in elevated reporting limits.

The initial analysis of sample WP3906-30 was performed outside of the twelve hour BFB tuning window. This was recognized during data review, and the subsequent reanalysis was outside of analytical holding times. Only the reanalysis performed outside of holding times is included in this data package.



Initial analyses of samples WP3906-36 and -44 yielded concentrations of target analytes over the upper limit of the calibration curve. Reanalyses occurred at 1:50 and 1:5 dilutions, respectively. Both sets of data for each sample are included in the data package.

Analysis of the QC samples WP3906-19MS/MSD yielded target analyte concentrations over the upper limit of the calibration curve. In accordance with the method, no laboratory action was taken with these samples.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" (software-generated) on the pertinent quantitation reports. All "M" flags have been dated and initialed by the analyst performing the integration. In addition, all "M" flags have been reviewed and approved by the GC/MS supervisor. Copies of each manual integration are included in the pertinent quantitation reports.

No other protocol deviations were noted by the volatile organics staff.

Semivolatile Organic Analysis

Twenty-three aqueous samples were received by Katahdin Analytical Services laboratory on September 14, 1999 for analysis in accordance with 8270C for a client specified PAH list of analytes.

Extraction of samples WP3906 3-12 and 15-18 occurred following USEPA method 3510 on September 16, 1999. A laboratory control spike/laboratory control spike duplicate pair was extracted in the batch. Samples WP3906-13 and -19-25 were extracted following USEPA method 3510 on September 17, 1999. A laboratory control sample, along with a site-specific MS/MSD pair on sample WP3906-19, was extracted in this batch. The remaining sample, WP3906-14, was extracted following USEPA method 3510 on September 20, 1999. A laboratory control sample was also extracted in this batch.

Analysis of sample WP3906-19 yielded a concentration of the analyte naphthalene over the upper limit of the calibration curve. Reanalysis occurred at a 1:2 dilution successfully. Both sets of data for this sample are included in this data package.

Initial analysis of sample WP3906-22 yielded internal standard area recovery deviations. Reanalysis yielded similar results, confirming matrix interference. Both sets of data are included in this data package.

Several manual integrations were performed due to split peaks; all have been flagged with a "M" by the data system. All manual integrations have been dated and initialed by the responsible analyst. Copies of each manual integration are included in the data package. All manual integrations have been reviewed and approved by the GC/MS supervisor.

No other protocol deviations were noted by the semivolatiles organics staff.



Metals Analysis

The samples of Katahdin Work Order WP3906 were prepared and analyzed for metals in accordance with the "Test Methods for Evaluating Solid Waste", SW-846, November 1986, Third Edition.

Inductively-Coupled Plasma (ICP) Atomic Emission Spectroscopic Analysis

Aqueous-matrix Katahdin Sample Nos. WP3906- (1-25, 28-46) were digested for ICP analysis on 09/17/99 (QC Batch PI17ICW0), 09/21/99 (QC Batch PI21ICW0), and 09/22/99 (QC Batch PI22ICW0) in accordance with USEPA Method 3010A. Katahdin Sample Nos. WP3906- (19, 46) were prepared with duplicate matrix-spiked aliquots during digestion.

ICP analyses of Katahdin Work Order WP3906 sample digestates were performed in accordance with USEPA Method 6010B, using a Thermo Jarrell Ash (TJA) Trace ICP spectrometer and a TJA 61 ICP spectrometer. All samples were analyzed within holding times and all QC criteria were met with the following comments or exceptions:

Some of the results for run QC samples (ICV, ICB, CCV, CCB, ICSA, and ICSAB) included in the accompanying data package may have exceeded acceptance limits for some elements. Please note that all client samples and batch QC samples associated with out-of-control results for run QC samples were subsequently reanalyzed for the analytes in question.

Analysis of Mercury by Cold Vapor Atomic Absorption (CVAA) Spectrophotometry

Aqueous-matrix Katahdin Sample Nos. WP3906- (1-25, 28-35) were digested for mercury analysis on 09/22/99 (QC Batch PI22HGW0), 09/25/99 (QC Batch PI25HGW0), and 09/27/99 (QC Batch PI27HGW0) in accordance with USEPA Method 7470A. Katahdin Sample No. WP3906-1 was prepared with a single matrix-spiked aliquot, and Katahdin Sample Nos. WP3906- (19, 21) were prepared with duplicate matrix-spiked aliquots during digestion.

Mercury analyses of Katahdin Work Order WP3906 sample digestates were performed using a Leeman Labs PS200 automated mercury analyzer. All samples were analyzed within holding times and all run QC criteria were met.

Wet Chemistry Analysis

Due to IC instrument failure, alternate methods were approved for work order WP3906 by Kelly Johnson-Carper for the analysis of nitrate and sulfate. Nitrate analyses (353.2) and Sulfate analyses (375.4) were performed according to the U.S. EPA, Methods for Analysis of Water and Wastes, EPA 600/4-79-020, 1979, Revised 1983. Nitrate analyses (E300) were performed according to the U.S. EPA "Methods for the Determination of Inorganic Substances in Environmental Samples", EPA 600/R-93/100, August 1993. All samples were analyzed within analytical hold times.

The Wet Chemistry staff noted no protocol deviations.

KATAHDIN ANALYTICAL SERVICES, SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400 Fax (207) 775-4029		··.		LAB (WORK ORDER) #
CLIENT: Tetrated NUS		-		SDG#
PROJECT: CN C CHARLESTON	•	-		DELIVERED BY: RECEIVED BY: LIMS ENTRY BY: BER BER LIMS REVIEW BY / PM: ACC
Mu	YES /	NO	EXCEPTIONS	COMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?		-		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	4			
3. CHAIN OF CUSTODY SIGNED BY CLIENT?				
4. CHAIN OF CUSTODY MATCHES SAMPLES?				·
5. TEMPERATURE BLANKS PRESENT?				TEMP BLANK TEMP (*C)=21/
6. SAMPLES RECEIVED AT 4°C (27 (ICE) ICE PACKS PRESENT (Y) N7	9			COOLER TEMP (*C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?				<u> </u>
8. TRIP BLANK PRESENT IN THIS COOLER				
9. PROPER SAMPLE CONTAINERS AND VOLUME?	Ø			<u>·</u>
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?				
11. SAMPLES PROPERLY PRESERVED(1)?				·
12. CORRECTIVE ACTION REPORT FILED?			N/A	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	ERCIAL	CLP HAZ	ZWRAP NFESC AC	COE AFCEE OTHER (STATE OF ORIGIN):
LOG-INNOTES(1): HNO2 added to	metas GCM	alig 1101 j	36 GLM 0601	1366LM0201, 366LM0701, 366LM0401,
		`.	1	

(1) Use this check if

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KATAHD ANALYTICAL SERVICES, INC. SAMPLE RECEIPT CONDITION REPORT Tel. (207) 874-2400 Fax (207) 775-4029	*•	LAB (WORK ORDER) # PAGE: COOLER:	OF 12
CLIENT: TEtrated NUS	-	COC# SDG# DATE / TIME RECEIVED:_ DELIVERED BY:_ RECEIVED BY:_	09-14-99~0900 FED EX
PROJECT: CN C CHAMESTON	-	LIMS ENTRY BY: LIMS REVIEW BY / PM:	BKK BKK AJC
Vin		_	
YES 1. CUSTODY SEALS PRESENT / INTACT?	NO EXCEPTIONS	COMMENTS	RESOLUTION
2: CHAIN OF CUSTODY PRESENT IN THIS COOLER?			
3. CHAIN OF CUSTODY SIGNED BY CLIENT?			
4. CHAIN OF CUSTODY MATCHES SAMPLES?		·	
5. TEMPERATURE BLANKS PRESENT?	ם ם	TEMP BLANK TEMP ('C)= 1.3	ASC notitied Jeff Alexan
6. SAMPLES RECEIVED AT 4°C 1,27 (ICE) ICE PACKS PRESENT Y) 1 N7	g 0	COOLER TEMP (°C)= NA	
7. VOLATILES FREE OF HEADSPACE?			
8. TRIP BLANK PRESENT IN THIS COOLER			
9. PROPER SAMPLE CONTAINERS AND VOLUME?			
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?			
11. SAMPLES PROPERLY PRESERVED(1)?		·	
12. CORRECTIVE ACTION REPORT FILED?	N/A		
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL	CLP HAZWRAP/ NFESC	ACOE AFCEE OTHER (STATE OF ORIGIN):	
		010 - Jeff Alexander	
No containers to	~ 226LM03	010 - Jeft Alexander	sand ga c voss
Received Pb bottle	e fex 256LM	0401 - Jeff Alexander so	id to add to coc

Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC.	LAB (WORK ORDER) #
SAMPLE RECEIPT CONDITION REPORT	2 12
Tel. (207) 874-2400	PAGE: 3 OF 12
Fax (207) 775-4029	COOLER: 3 OF 12
` 	COOLEROrC
	COC#
CLIENT: Tetrated NUS	SDG#
	DATE / TIME RECEIVED: 09-14-99 - 09 50
	DELIVERED BY: FED EX RECEIVED BY: RVK
PROJECT: CARCESTON	LIMS ENTRY BY: BEX
*	LIMS REVIEW BY / PM:
Mr.	
YES NO EXCEPTIONS	COMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	
2:CHAIN OF CUSTODY PRESENT IN THIS COOLER?	
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	
4. CHAIN OF CUSTODY MATCHES SAMPLES?	
5. TEMPERATURE BLANKS PRESENT?	TEMP BLANK TEMP (°C)=2. 6
6. SAMPLES RECEIVED AT 4°C/N,2?	COOLER TEMP (*C)= NA
(ICE) ICE PACKS PRESENT (Y) N?	(RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?	
8. TRIP BLANK PRESENT IN THIS COOLER	
9. PROPER SAMPLE CONTAINERS AND VOLUME?	
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	
11. SAMPLES PROPERLY PRESERVED(1)?	
12. CORRECTIVE ACTION REPORT FILED?	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP NEST	ACOE AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES[1]:	: :
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Use this prome (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, residual chlorine c

KATAHD NALYTICAL SERVICES	, INC.			(LAB (WORK ORDER) #
SAMPLE RECEIPT CONDITION REPO	ORT				\mathcal{A}
Tel. (207) 874-2400					PAGE: 4 OF 12
Fax (207) 775-4029					cooler: 4 of 12
CLIENT: Tetrated NUS					COC#
					DATE / TIME RECEIVED: 09-14-99-0900
_					DELIVERED BY: FED EX
PROJECT: CN C CHARLESTON					RECEIVED BY: LIMS ENTRY BY: BY BY
FROJECT.					LIMS'REVIEW BY / PM: KOC
Vm					
	YES	NO	EXCEPTIONS		COMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	V				
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?		<u>u</u>			
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	U		Ū		
4. CHAIN OF CUSTODY MATCHES SAMPLES?		3		•	
5. TEMPERATURE BLANKS PRESENT?					TEMP BLANK TEMP (°C)=22.0
6. SAMPLES RECEIVED AT 4°C 4.27 (ICE) ICE PACKS PRESENT Y 1 N7	9				COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?	9 /				
8. TRIP BLANK PRESENT IN THIS COOLER	V				
9. PROPER SAMPLE CONTAINERS AND VOLUME?	P				
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?					
11. SAMPLES PROPERLY PRESERVED(1)?		_ G _			<u> </u>
12. CORRECTIVE ACTION REPORT FILED?	2	9	N/A		
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	IERCIAL	CLP HA	ZWRAP NFESC	ACOE	AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES ⁽¹⁾ :					
			•		
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Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES,				LAB (WORK ORDER) # 1000 1000 1000 1000 1000 1000 1000 1
SAMPLE RECEIPT CONDITION REPO	DRT			PAGE: 5 OF 12
Tel. (207) 874-2400 Fax (207) 775-4029				
(··.		COOLER:OF12
				coc#
CLIENT: Tetratech NUS		_		SDG#
				DATE / TIME RECEIVED: 09-14-99-0900 DELIVERED BY: FED EX
PROJECT: CNC CHARLESTON				RECEIVED BY:
PROJECT:		_		LIMS ENTRY BY: BKK
Vm				LIMS REVIEW BY / PM:
<i>(-u</i>	YES	NO	EXCEPTIONS	COMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	Y			
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?		4		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?				
4. CHAIN OF CUSTODY MATCHES SAMPLES?		4		
5. TEMPERATURE BLANKS PRESENT?				TEMP BLANK TEMP (°C)=_3,2
6. SAMPLES RECEIVED AT 4°C + 27 ICE ICE PACKS PRESENT Y N7				COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?				
8. TRIP BLANK PRESENT IN THIS COOLER		'		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	9			
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	4			
11. SAMPLES PROPERLY PRESERVED(1)?		y		
12. CORRECTIVE ACTION REPORT FILED?		P	N/A	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	IERCIAL	CLP H	AZWRAP NFESC AC	OE AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES ⁽¹⁾ :				
			•	·
			``	·

Use this check if ded. If samples required pH adjustment, record volume and type of preservative a

KATAHE ANALYTICAL SERVICES			((LAB (WORK	ORDER) #_	WP39	<u>104</u>	
SAMPLE RECEIPT CONDITION REPORTEL (207) 874-2400	ORT				PAGE:	6	OF	12	
Fax (207) 775-4029	.,				COOLER:	4	OF	12	
CLIENT: Tetrated NUS					COC# SDG# DATE / TIME	RECEIVED	: 09-1	<u></u>	900
PROJECT: CNC. CHEMIESTON					DELIVERED RECEIVED E LIMS ENTR' LIMS REVIE	3Y: / BY:	B	DEX	
Vm	YEŞ 🥕	NO	EXCEPTIONS		COMMENTS		RES	OLUTION	
1. CUSTODY SEALS PRESENT / INTACT?	Y								
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?							_		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	U								
4. CHAIN OF CUSTODY MATCHES SAMPLES?		9		~					_
5. TEMPERATURE BLANKS PRESENT?					TEMP BLANK TEMP (°C)	<u> 3.1 </u>			
6. SAMPLES RECEIVED AT 4°C - 27 (ICE) ICE PACKS PRESENT (Y) N?					COOLER TEMP (*C)= _ (RECORD COOLER TEM	<u>N</u>	_	NOT PRESEN	<u></u>
7. VOLATILES FREE OF HEADSPACE?								.	•
8. TRIP BLANK PRESENT IN THIS COOLER		3							
9. PROPER SAMPLE CONTAINERS AND VOLUME?									
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?			. 🚨		•				
11. SAMPLES PROPERLY PRESERVED(1)?		ď							<u> </u>
12. CORRECTIVE ACTION REPORT FILED?		1	N/A				- -		
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	IERCIAL CL	LP HAZ	WRAP NFESC	ACOE	AFCEE OTHER (STAT	E OF ORIGIN):	· 		
LOG - IN NOTES ⁽¹⁾ :			<u></u>			·			
			•						
		``	i e						

Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added,

KATAHDIN ANALYTICAL SERVICES, II	NC.			LAB (WORK ORDER) #
SAMPLE RECEIPT CONDITION REPOR	RΤ		·	 \\\
Tel. (207) 874-2400 Fax (207) 775-4029				PAGE: 7 OF 12
1 ax (201) 113-4025		·-·		COOLER:OF12
-() ,				COC# —
CLIENT: Tetrated NUS				SDG#
				DATE / TIME RECEIVED: 09-14-99-0900
				DELIVERED BY: FED EX
PROJECT: CN C CHARLESTON		_		LIMS ENTRY BY:
•		-		LIMS REVIEW BY / PM: XJC
Vin .	YES 🕕	NO	EXCEPTIONS	COMMENTS RESOLUTION
•				- NEGOEOTION
2:CHAIN OF CUSTODY PRESENT IN THIS COOLER?		4		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?				
4. CHAIN OF CUSTODY MATCHES SAMPLES?		2		
5. TEMPERATURE BLANKS PRESENT?		, 0		TEMP BLANK TEMP (°C)=_3-0
6. SAMPLES RECEIVED AT 4°C 12? (ICE) ICE PACKS PRESENT Y 1 N7				COOLER TEMP ("C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?				<u> </u>
8. TRIP BLANK PRESENT IN THIS COOLER			<u> </u>	
9. PROPER SAMPLE CONTAINERS AND VOLUME?	9			
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?				
11. SAMPLES PROPERLY PRESERVED(1)?				
12. CORRECTIVE ACTION REPORT FILED?			N/A	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMER	RCIAL C	CLP HAZ	ZWRAP NFESO	ACOE AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES ⁽¹⁾ :				
			•	
		`,	1	

Use this cap (and additional sheets if necessary) to document samples that are received broketek to document samples required pH adjustment, record volume and type of preservative s

KATAHI ANALYTICAL SERVICES,				LAB (WORK ORDER) # W03904
SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400	DRT			PAGE: 8 OF 12
Fax (207) 775-4029				cooler: 8 of 12
1				COC# —
CLIENT: Tetrated NUS		_		SDG#
				DATE / TIME RECEIVED: 09-14-99 ~ 09 (70) DELIVERED BY: EED EX
PROJECT: CALCHARESTON				RECEIVED BY: LIMS ENTRY BY: BKA
		_		LIMS REVIEW BY / PM: ATC
Vm	YES	NO	EXCEPTIONS	COMMENTS . RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	Y			
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?		7		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	1			
4. CHAIN OF CUSTODY MATCHES SAMPLES?		ं 🗹		·
5. TEMPERATURE BLANKS PRESENT?				TEMP BLANK TEMP (°C)=22.
6. SAMPLES RECEIVED AT 4°C 2? (ICE) ICE PACKS PRESENT (Y) N?	9			COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?	2			· · · · · · · · · · · · · · · · · · ·
8. TRIP BLANK PRESENT IN THIS COOLER		2		
9. PROPER SAMPLE CONTAINERS AND VOLUME?				
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?				· · · · · · · · · · · · · · · · · · ·
11. SAMPLES PROPERLY PRESERVED ⁽¹⁾ ?				·
12. CORRECTIVE ACTION REPORT FILED?		1	N/A	<u> </u>
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	ERCIAL	CLP HA	ZWRAP (NFESC	ACOE AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES ⁽¹⁾ :				
LOG-IN NOTES .				
			•	
		•		

Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES,	INC.			LAB (WORK ORDER) # 1003904
SAMPLE RECEIPT CONDITION REPO	ORT			^
Tel. (207) 874-2400				PAGE: 9 OF 12
Fax (207) 775-4029				9 , 2
				COOLER: 9 OF 12
				COC#
CLIENT: Tetrated NUS				SDG#
CLIENI.		-		DATE / TIME RECEIVED: 09-14-99 ~ 09.00
				DELIVERED BY: FED EX
- ALC CUARIESTOA)				RECEIVED BY:
PROJECT: CN C CHAMESTON				LIMS ENTRY BY: BY-
	4	_		LIMS REVIEW BY / PM: ASC
Vm				
	YES	NO	EXCEPTIONS	COMMENTS RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	V		, 🗆	
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?		a		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?				
4. CHAIN OF CUSTODY MATCHES SAMPLES?				
5. TEMPERATURE BLANKS PRESENT?		_ 🗆		TEMP BLANK TEMP (°C)=2/
6. SAMPLES RECEIVED AT 4°C, 44, 27				COOLER TEMP (*C)= NA
(ICE) ICE PACKS PRESENT (Y) N7				(RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)
7. VOLATILES FREE OF HEADSPACE?	2			· · · · · · · · · · · · · · · · · · ·
8. TRIP BLANK PRESENT IN THIS COOLER		2		
9. PROPER SAMPLE CONTAINERS AND VOLUME?			. 🗖	
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?				
11. SAMPLES PROPERLY PRESERVED ⁽¹⁾ ?		d	_ ם	
12. CORRECTIVE ACTION REPORT FILED?		A	N/A	
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMI	ERCIAL	CLP HA	ZWRAP NFESC AC	OE AFCEE OTHER (STATE OF ORIGIN):
LOG - IN NOTES(1):				
		1	1	

0000227

Use this space (and additional sheets if necessary) to document samples that are received broke check if right samples required pH adjustment, record volume and type of preservative additional sheets if necessary) to document samples that are received broke.

KATAH ANALYTICAL SERVICES,	INC.		(LAB (WORK ORDER) # <u>1003904</u>	<u>\</u> /
SAMPLE RECEIPT CONDITION REPO					10	
Tel. (207) 874-2400					PAGE: 10 OF 12	
Fax (207) 775-4029					cooler: 10 of 12	
		••			COOLER: U OF 12	•
					COC#	
CLIENT: Tetrated NUS					SDG#	
						1~09.00
					DELIVERED BY: FED F	; Y
PROJECT: CN C CHANGESTON					LIMS ENTRY BY:	
 	^				LIMS REVIEW BY / PM: K24	
Mu	Vice	NO	EVCEDTIONS		COMMENTS	N
	YES	, NO	EXCEPTIONS		COMMENTS RESOLUTION	DN .
1. CUSTODY SEALS PRESENT / INTACT?			_			
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?	U ,	, Ø				
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	4				-	
4. CHAIN OF CUSTODY MATCHES SAMPLES?		₫		-		
5. TEMPERATURE BLANKS PRESENT?	B				TEMP BLANK TEMP (°C)₹37. /	
6. SAMPLES RECEIVED AT 4°C/H ₂ 2?	ET .				COOLER TEMP (°C)= NA	
ICE ICE PACKS PRESENT (Y) N?					(RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT P	RESENT)
7. VOLATILES FREE OF HEADSPACE?	2					
8. TRIP BLANK PRESENT IN THIS COOLER		Ø				
9. PROPER SAMPLE CONTAINERS AND VOLUME?						
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	Ø					
11. SAMPLES PROPERLY PRESERVED(1)?		2			·	
12. CORRECTIVE ACTION REPORT FILED?		Ø	N/A			
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMM	ERC AL	CLP HA	ZWRAP NFESC	ACOE	AFCEE OTHER (STATE OF ORIGIN):	
LOG - IN NOTES ⁽¹⁾ :						
200 11110120						
			•			

Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

KATAHDIN ANALYTICAL SERVICES, INC	.	LAB (WORK ORDER) #	
SAMPLE RECEIPT CONDITION REPORT Tel. (207) 874-2400		PAGE: // OF 12	
Fax (207) 775-4029			-
	٠.	COOLER: 1 of 12	-
CLIENT: Tetrated NUS		COC# SDG#	_
3.12.11.		DATE / TIME RECEIVED: 09-14-99-0900	_
PROJECT: CNCCHARLESTON		DELIVERED BY: FED EX	-
PROJECT:		LIMS ENTRY BY: BK. W	_
Vm		LIMS REVIEW BY / PM:A) C	-
YES		COMMENTS RESOLUTION	
' COUTON GENES PREGENT/INTAGT?			-
2.CHAIN OF CUSTODY PRESENT IN THIS COOLER?			-
3. CHAIN OF CUSTODY SIGNED BY CLIENT?			-
4. CHAIN OF CUSTODY MATCHES SAMPLES?		Ascnotified sett the	- ~~~
5. TEMPERATURE BLANKS PRESENT?		TEMP BLANK TEMP (*C)= 1. All 49	_
6. SAMPLES RECEIVED AT 4°C +1, 27 (ICE) ICE PACKS PRESENT (Y) 1 N7		COOLER TEMP (*C)= <u>NA</u> (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	-
7. VOLATILES FREE OF HEADSPACE?	r o o		_
8. TRIP BLANK PRESENT IN THIS COOLER	1 🗘 🗆		_
9. PROPER SAMPLE CONTAINERS AND VOLUME?			_
10. SAMPLES WITHIN HOLD TIME: UPON RECEIPT?	r 🛛 🗎		
11. SAMPLES PROPERLY PRESERVED ⁽¹⁾ ?			_
12. CORRECTIVE ACTION REPORT FILED?	N/A		_
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIA	AL CLP HAZWRAP NFESC	ACOE AFCEE OTHER (STATE OF ORIGIN):	=
LOG - IN NOTES ⁽¹⁾ :			
)		

Use this specification and additional sheets if necessary) to document samples that are received broken compromised, C-O-C discrepancies, radiation checks, residual chlorine check if residual chlorine check, residual chlorine check, residual chlorine check, residual chlorine check, residual chlorine check, residual chlorine check, residual chlorine check, residual chlorine check, residual chlorine check if residual chlorine check, residual chlorine check if residu

KATAH ANALYTICAL SERVICES,				· ·	LAB (WORK ORDER) #	JP3906 /	
SAMPLE RECEIPT CONDITION REPO Tel. (207) 874-2400	RT				PAGE: 12	of 12	
Fax (207) 775-4029		···			COOLER:12	of 12	
CLIENT: Tetrated NUS					COC#		
		_			DATE / TIME RECEIVED: DELIVERED BY:	09-14-99-0900 FEDEX	
PROJECT: CN C CHARLESTON		_			RECEIVED BY:LIMS ENTRY BY:	BKK	
Vm	•				LIMS REVIEW BY / PM:	AJC	
	YES	NO	EXCEPTIONS		COMMENTS	RESOLUTION	
1. CUSTODY SEALS PRESENT / INTACT? , 2:CHAIN OF CUSTODY PRESENT IN THIS COOLER?							
3. CHAIN OF CUSTODY SIGNED BY CLIENT?			ā				
4. CHAIN OF CUSTODY MATCHES SAMPLES?			ū	•			
5. TEMPERATURE BLANKS PRESENT?					TEMP BLANK TEMP (°C)= 3./		
6. SAMPLES RECEIVED AT 4°C 42? (ICE) ICE PACKS PRESENT (Y) N?					COOLER TEMP (*C)= NA (RECORD COOLER TEMP ONLY IF TEMP BI	LANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?						<u>. </u>	
8. TRIP BLANK PRESENT IN THIS COOLER		4					_
9. PROPER SAMPLE CONTAINERS AND VOLUME?							
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?							
11. SAMPLES PROPERLY PRESERVED(1)?	u						
12. CORRECTIVE ACTION REPORT FILED?	u		N/A	•			
13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMI	ERCIAL	CLP HA	ZWRAP (NFES	ACOE	AFCEE OTHER (STATE OF ORIGIN):		
LOG - IN NOTES ⁽¹⁾ :							
			•				
			,				

⁽¹⁾ Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if raquired. If samples required pH adjustment, record volume and type of preservative added.

Katahdin West

340 County Road No. 5 P.O. Box 720 Westbrook, ME 04098 Tel: (207) 874-2400

CHAIN of CUSTODY

Fax: (207) 775-4029 PLEASE PRINT IN PEN Page_ of Phone # (843)554-Fax # 44251 NUS In City State Zip Code 50 Purchase Order # Proj. Name / No. Katahdin Quote # Bill (if different than above) Address Sampler (Print / Sign) Copies To: ANALYSIS AND CONTAINER TYPE PRESERVATIVES WORK ORDER LAB USE ONLY Filt. Filt. Filt. Filt. Filt. Filt. Filt. Filt. Filt. Filt. Filt. Filt. KATAHDIN PROJECT MANAGER REMARKS: ☐ FED EX □ UPS CLIENT SHIPPING INFO: AIRBILL NO: TEMP BLANK □ INTACT NOT INTACT TEMP°C 的政 No. of Cntrs. Date / Time Sample Description Matrix coll'd 23 6 LM0401 23 6LX0301 236LX0401 236LX0401 23 FLM05 DO1 236L Molol 23TL0020 KGLM7DOI 6 255M0301 1510 222-TWO 801 3 3 a 25EYW0901 25GLM070) 2 マ 25GLM0401 S acclP1201 コ 26GLP1301 2 333 COMMENTS Date / Time Religioushed By: (Signature) Time Received By: (Signature) Relinquished By: (Signature) Relinquished By: (Signature) Date / Time Received By: (Signature) Relinquished By: (Signature) Date / Time Received By: (Signature)

Katahdin Katahdin

340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098
Tel: (207) 874-2400
Fox: (207) 775-4020

CHAIN of CUSTODY

PLEASE PRINT IN PEN

Page 2 05

Client TECH NU	5		Contac	CAU	IGA		Phone # 850)		9899	Fa	×# 550)	350	9860		
N/	PARK DR 102 City TALL				* -										
Purchase Order #	Proj. Name / No.					Katahdin Quote #									
Bill (if different than above)			Ac	idress											
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LAB USE ONLY WORK ORDE	^{R#:} WP3906	- *	7		- Pri			RESER	ONTAIN VATIVES			É	F-11		
REMARKS:	IOJECT MANAGER			Filt.	Filt. DYDN	Filt, □Y□N	Filt. DYDN	Filt.	Filt. OYON	Filt. DYDN	Filt.	Filt. DY D N	Filt.		
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TEMP°C TEMP BLAN	K 🗆 INTACT	D NOT	INTACT		200	ر. و بد	33	Mions	:				,		
* Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	BTEX, MITOR, EDB., TOTAL NION, (HCL)	Z Z	Metals (HNO.)	Dissolved (HCI)	Anions		:	:		-		
366LMØ601	RI399/1015	GW	10	3	a	1	3	1			_	_			
3661MB201	91399/1055	_	10	3	a		3	-	-						
366MØ3Ø1	91399/1131	GW	10	3	a	l	3	-							
GLMOZOID	91399/0000	GW	6	3	2										
32 GLMØ1Ø1	91099/1130	SW	4	3	a	[_			
22 GLMØ201	91099/1110	GW	6	3	a										
226LM0501	91099/1418	Gw	6	3	a	1				_		•			
22 GLM0701	91099/1420	Gω	ن	3	a	<u> </u>							_		
ARGUMOROLD	91099/0000	GW	6-	3	2	1_	BK								
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FORMSQUACE INC. 12 (207) 782-3311 FORM # CHN-OF-CSTDY															

Katahdin 340 County Road No. 5 P.O. Box 720 Westbrook, ME 04098 Tel: (207) 874-2400

CHAIN of CUSTODY

5... 3

	Fax: (2	07) 775-4029						PLEAS	- PHIN	HITE	·	га	ge	<u> </u>
CI	Tetra Tech NI			Paul	Call	igan		hone # 850)	385	989	9 (8			
Ac	dress 1401 Oven Pa	irk Dr 102	0.4		hass	. }		tate Z	<i></i>		Zip Code	32	308	
Pι	rchase Order #	Proj	, Name / N	lo.						Katahdi	n Quote i	#		
Bi	(if different than above)			Ac	Idress									
Sa	mpler (Print / Sign) P. Halv	erson	-		•	_			Copie	s To:	-	_		
L	AB USE ONLY WORK ORDER	1# WP 3904							PRESER	VATIVES				
	KATAHDIN PRO	OJECT MANAGER			Filt. □Y□N	Fil. 2	Filt. OYON		Filt. DYDN	Filt. □Y□N	Filt.	Filt. OYON	Filt. □Y□N	Filt.
_	EMARKS.				:	TBE, HC		Wellan		:				
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ı	MP°C	< ☐ INTACT	☐ NOT	INTACT	2 G	S	- one	S (3	Anions (None)		-			
*	Sample Description	Date / Time coll'd	Matrix	No. of Cntrs.	Metals (HNOS)	BTEX, COB, A	PAH (None)	ΣŸ	40		:		.	
	42GLM1001	91298/0941	GUI	4	1	3	a							
	42GLM0701	91299/1000		9		3	2	3			·			-
	42GLM1201	91279/1030		6		S.	χ]		
	42 GLM0901	91299/1030	GW	49		W	2	3						
	426M0801	91299/1057		6	1	3	V		· -					
	42GW1101	91299/1104	GW	9	l	S	8	3						
	426(M0101	91299/1435		19	1	3	0	3	/					
	426LM/301	91290/1449		10	(3	2	3	1					
	426LM 0601	91299 1535	GW	6	1	ß	2							
	426LM6701	91299 1202	GW	L					1_					
	42 GLM0901	91299/1706	GW						1_					
	426LM 110L	91294 1204	GW	1					1					
	42GM0701D	91299/0000	GW	6	1	3	2							
	42GLMOIOID	91299000		4		3	2							I
	42GLM1001M	91299/0941	GW	6	1	3	4		•		<u> </u>			
	42GLM 1801	91399/0842		6	i	3	2				•			
ĊŌ	MMENTS									- ' "				· · · · · · · · · · · · · · · · · · ·
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F			ived By: (S				ed By: (S	Signature) Da	te / Tir	ne R	eceived	By: (Signa	ature)

Katahdin

340 County Road No. 5
P.O. Box 720
Westbrook, ME 04098 STRVICES Tel: (207) 874-2400

CHAIN of CUSTODY

Page \ R

Fax: (207) 775-4029				E FRIMI IN FE	
TETRA TECH NUS	Pau	CpW60	N (BSD)	385-98	99 (850)
-\$1401 OVEN PARK I	DR. City TALL	14 HASSE	E State	T	Zip Code 32368
Purchase Order #	Proj. Name / No.			Katahdi	ri Quote #
Bill (if different than above)	1 . Ac	ddress			
Sampler (Print / Sign) P. HALUERSON	J tolle			Copies To:	
LAB USE ONLY WORK ORDER #: WP3	906 -			S AND CONTAIN PRESERVATIVES	8
KATAHDIN PROJECT MANAGE	EA	Filt. Filt.	Filt. Filt.	Filt. Filt.	Filt. Filt. Filt. Filt. OYONOYON
REMARKS:		8			
SHIPPING INFO: FED EX UPS	☐ CLIENT	LS BEE			
TEMP°C	T O NOT INTACT	15 OE 3	17		
★ Sample Description Date / Tir	me Matrix No. of Cntrs.	医主菌管	(E)		:
366LM0101 91099/11	110 GW 1				
36 GLO680004 9109/11	115 GW 1				
36GLM 0701 9109411	20 GW 6	١ 3	2		
36GLM0401 9109415	510 GW 6	1 3	2		
366LM0501 91091	515 CN 6	1 3	2		
\$266m0401 9189/1		1 3	2		
4264010301 9119911		1 3	2		
42GLM0201 91199/10	545 GW 6	1 3	2		
1426LM0501 91199/1	635 GN 6	1 3	2		
	125 GW 6	13	a		
	1110 GW 6	1 3	2		
V 42 GLM 1501 2119/11		1 3	a		
	25 GW 4	1 3	a		
42TLODIO1 4/13/6	99 2	2			
/		_			
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COMMENTS		1		<u>. </u>	
quished By: (Spnature) Date / Time	Received By: (Signature		hed By: (Signature	9-1499 ON	me Reperved By: (Signature)
Relinquished By: (Signature) Date 7 Time	813 458 369 Received By: (Signature		hed By: (Signature	<u> </u>	

Page 1

ORDER NO WP-3906

Project Manager: Andrea J. Colby

ORDER DATE: 09/14/99

REPORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

PHONE: 850/385-98

FAX: 850/385-96

DUE: 14 OCT FAC.ID: CNC CHARLESTON

PHONE: 412/921-7090

PO: N7912-P99264

INVOICE:

ACCOUNTS PAYABLE

TETRA TECH NUS, INC.

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220 PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

ITEM LOG NUMBER SAMPLE DESCRIPTION

1 WP3906-1 36GLM0101

10 SEP 1110

SAMPLED DATE/TIME

RECEIVED

14 SEP ΑQ

WP3906-2 36GL0680004

DETERMINATION

10 SEP 1115

METHOD OTY PRICE AMOUNT 200.00 100.00

Target Analyte List Metals, Total

LABORATORY ORDER CONTINUED ON PAGE

TITITE ANALYTICAL DERVICED, INCORPORATED New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 2

ORDER NO WP-3906 Project Manager: Andrea J. Colby

ORDER DATE: 09/14/99 PHONE: 850/385-9899

F ORT TO: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

DUE: 14 OCT FAC.ID: CNC CHARLESTON

Tallahassee, FL 32308

ACCOUNTS PAYABLE INVOICE:

TETRA TECH NUS, INC.

PHONE: 412/921-7090 PO: N7912-P99264

FAX: 850/385-9860

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220 PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	RECEIVED	MATRIX
2	WP3906-3	36GLM0701	10 SEP 1120	14 SEP	AQ
	WP3906-4	36GLM0401	10 SEP 1510		
	WP3906-5	36GLM0501	10 SEP 1515		
	WP3906-6	42GLM0401	11 SEP 1055		
	WP 3906-7	42GLM0301	11 SEP 1050		
	WP3906-8	42GLM0201	11 SEP 1045		
•	WP3906-9	42GLM0501	11 SEP 1035		
	WP3906-10	42GLM1401	11 SEP 1125		
	WP3906-11	42GLM1701	11 SEP 1110		
	WP3906-12	42GLM1501	11 SEP 1110		
	WP3906-13	42GLM1601	11 SEP 1125		
	WP3906-14	36GLM0201D	13 SEP		
	WP3906-15	22GLM0101	10 SEP 1130		
	WP3906-16	22GLM0201	10 SEP 1110		
	WP3906-17	22GLM0501	10 SEP 1418		
	WP3906-18	22GLM0701	10 SEP 1420		
	WP3906-19	42GLM1001	12 SEP 0941		
	WP3906-20	42GLM1201	12 SEP 1030		
	WP3906-21	42GLM0801	12 SEP 1057		
	WP3906-22	42GLM0601	12 SEP 1535		
	WP3906-23	42GLM0701D	12 SEP 0000		
	WP3906-24	42GLM0101D	12 SEP 0000		
	WP3906-25	42GLM1801	13 SEP 0842		

<u>DETERMINATION</u>	METHOD	OTY	PRICE	AMOUNT	
Target Analyte List Metals, Total		23	100.00	2300.00	
Volatile Organics by 8260B	SW8260	23	75.00	1725.00	
Polynuclear Aromatic Hydrocarbons	EPA 8270	23	125.00	2875.00	
					_
TOTALS		23	300.00	6900.00	

ORDER NO WP-3906 Project Manager: Andrea J. Colby

ORDER DATE: 09/14/99

REPORT TO: Paul Calligan

PHONE: 850/385-98

Tetra Tech NUS

FAX: 850/385-96

1401 Oven Park Dr., Suite 102

DUE: 14 OCT

Tallahassee, FL 32308

FAC.ID: CNC CHARLESTON

INVOICE: ACCOUNTS PAYABLE

TOTALS

PHONE: 412/921-7090

TETRA TECH NUS, INC.

PO: N7912-P99264

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220 PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	I DDD BI. I IIIDVDRDON, I IIIO	, o., o. i.i.(12	02.0222	21. 1222		
	LOG NUMBER SAMPLE DESCRIPT	ON	SAMPLED D	ATE/TIME	RECEIVE) MATRIX
3			13	SEP	14 SEI	P AQ
-	WP3906-27 23TL00201		10	SEP 0800		~
	DETERMINATION		METHO	D QTY	PRICE	AMOUNT
	Volatile Organics by 8260B		SW8260	2	75.00	150.00
	VOIACITE Organics by 0200B		540200	2	75.00	130.00
	LOG NUMBER SAMPLE DESCRIPTI	ON	SAMPLED D	ATE/TIME	RECEIVE	O MATRIX
4	WP3906-28 36GLM0601		13	SEP 1015	14 SEI	
	WP3906-29 36GLM0201		13.	SEP 1055		~
•	WP3906-30 36GLM0301		13	SEP 1131		
	WP3906-31 42GLM0701		12	SEP 1202		
	WP3906-32 42GLM0901		12	SEP 1206		
	WP3906-33 42GLM1101			SEP 1204		
	WP3906-34 42GLM0101		12	SEP 1435		
	WP3906-35 42GLM1301		12	SEP 1449		
	DETERMINATION		METHO	D QTY	PRICE	AMOUNT
	Target Analyte List Metals,	Total	7.11110	8	100.00	
	Volatile Organics by 8260B	rocur	SW8260	8	75.00	600.00
	Polynuclear Aromatic Hydroca	rhone	EPA 827		125.00	1000.00
	Nitrate as N	11,0110	353.2	8	30.00	240.00
	Sulfate		375. 4	8	0.00	
	Methane Subcontract		3/3.4	8	95.00	760.00
	Methane Subcontract			ø	33.00	700,00

8 425.00 3400.00

RAIMIDIN ANADILLAND BERVIADD, INCORPORALED New England-ME Laboratory (207) 874-2400 CONFIRMATION

Page 4

ORDER NO WP-3906

Project Manager: Andrea J. Colby

ORDER DATE: 09/14/99

האד TO: Paul Calligan

PHONE: 850/385-9899 FAX: 850/385-9860

Tetra Tech NUS

DUE: 14 OCT

1401 Oven Park Dr., Suite 102 Tallahassee, FL 32308

FAC.ID: CNC CHARLESTON

INVOICE:

ACCOUNTS PAYABLE

PHONE: 412/921-7090

TETRA TECH NUS, INC.

PO: N7912-P99264

FOSTER PLAZA 7, 661 ANDERSEN DR.

PROJECT: CTO #68

PITTSBURGH, PA 15220

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/T	IME	RECEIVE	MATRIX
5	WP3906-36	23GLM0401	10 SEP 1	517	14 SER	P AQ
	WP3906-37	23GLX0301	10 SEP 1	.535		
	WP3906-38	23GLX0401	10 SEP 1	540		
	WP3906-39	23GLX0401D	10 SEP			
	WP3906-40	23GLM05D01	10 SEP 1	600		
	WP3906-41	23GLM0101	10 SEP 1	630		
	WP3906-42	25GLM0301	12 SEP 1	510		
	WP3906-43	25GLM0801	12 SEP 1	.555		
	WP3906-44	25GLM0601	12 SEP 1	620		
	WP3906-45	25GLM0401	13 SEP 1	140		
	DETERMINATIO	N	METHOD C	TY	PRICE	AMOUNT
		ganics by 8260B	SW8260	10	75.00	750.00
	Polynuclear	Aromatic Hydrocarbons	EPA 8270	10	125.00	1250.00
	Lead, Total	1	200.7/6010	10	20.00	200.00
	•	nple Preparation	,	10	0.00	0.00
	TOTALS			10	220.00	2200.00
	LOG NUMBER	SAMPLE DESCRIPTION	SAMPLED DATE/I	CIME_	RECEIVE	<u>MATRIX</u>

WP3906-46 25GLMU/01	13 SEP	1112	14 SEF	, AQ
DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	1	75.00	75.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	1	125.00	125.00
Lead, Total	200.7/6010	1	20.00	20.00
Elements Sample Preparation		1	0.00	0.00
Nitrate as N	353.2	1	30.00	30.00
Sulfate	375.4	1	0.00	0.00
Methane Subcontract		1	95.00	95.00
TOTALS		1	345.00	345.00

ORDER NO WP-3906

Project Manager: Andrea J. Colby

ORDER DATE: 09/14/99 PHONE: 850/385-980@

REPORT TO: Paul Calligan

Tetra Tech NUS

FAX: 850/385-9

1401 Oven Park Dr., Suite 102

DUE: 14 OUT

Tallahassee, FL 32308

FAC. ID: CNC CHARLESTON

INVOICE:

ACCOUNTS PAYABLE

PHONE: 412/921-7090

TETRA TECH NUS, INC.

PO: N7912-P99264

FOSTER PLAZA 7, 661 ANDERSEN DR.

PITTSBURGH, PA 15220

PROJECT: CTO #68

SAMPLED BY: P.HALVERSON/T.THOMPSON/J.KRIEGERDELIVERED BY: FEDEXDISPOSE: AFTER 13

	<u>LOG NUMBER</u>	SAMPLE DESCRIPTION	SAMPLED DATE/TIME	<u>RECEIVE</u> D	MATRIX
7	WP3906-47	16GLM7D01	12 SEP 0755	14 SEP	AQ
	WP3906-48	26GLP1201	13 SEP 1345		
	WP3906-49	26GLP1301	13 SEP 1355		

DETERMINATION	METHOD	OTY	PRICE	AMOUNT
Volatile Organics by 8260B	SW8260	3	75.00	225.00
Polynuclear Aromatic Hydrocarbons	EPA 8270	3	125.00	375.00
TOTALS		3	200.00	600.00

ORDER NOTE: QC-II+ W/NARRATIVE

DD(KAS007QC-DB3) CNC CHARLESTON

REPORT COPY: MS. LEE LECK

TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.

PITTSBURGH, PA. 15220

REPORT AND DISK

INVOICE: With Report

TOTAL ORDER AMOUNT \$13,795.00

This is NOT an Invo

AJC/BKR

09-14Please contact KATAHDIN ANALYTICAL SERVICES promptly if you have any questi



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note	Note Text
A-1	Insufficient sample was provided to enable laboratory to achieve the laboratory's standard Practical Quantitation Level.
E .	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
0-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.



KATAHDIN ANALYTICAL SERVICES Summary of Report Notes

Report Note	Note Text
В	'B' flag denotes detection of this analyte in the laboratory method blank analyzed concurrently with the sample.
Ε	'E' flag indicates an estimated value. The analyte was detected in the sample at a concentration greater than the standard calibration range.
J	'J' flag denotes an estimated value less than the Laboratory's Practical Quantitation Level.
0-2	Sample dilution required for quantitation of one or more target analytes; therefore, standard laboratory Practical Quantitation Level (PQL) could not be achieved.

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0101

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-001

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	64.5	В		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	2.07	U		P	1
7440-39-3	BARIUM	22.0			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	113000			P	i
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	1290			P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	28800			P	1
7439-96-5	MANGANESE	178			P	1
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	18800			P	1
7782-49-2	SELENIUM	2.9	В		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	207000			P	1
7440-28-0	THALLIUM	7.5	В		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	8.6	В		P	1

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLO680004

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-002

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	36.2	В		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	2.07	. U		P	1
7440-39-3	BARIUM	47.2			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	104000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	8.0	В		P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	62200			P	1
7439-96-5	MANGANESE	25.2			P	Ĭ
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	39000			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	468000			P	i
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	8.1	В		P	1

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0701

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-003

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	146	В		P	3
7440-36-0	ANTIMONY	5.43	U		P	3
7440-38-2	ARSENIC	6.21	U		P	3
7440-39-3	BARIUM	103			P	3
7440-41-7	BERYLLIUM	0.99	U		P	3
7440-43-9	CADMIUM	5.82	U		P	3
7440-70-2	CALCIUM	264000			P	i
7440-47-3	CHROMIUM	12.93	U		P	3
7440-48-4	COBALT	13.35	U		P	3
7440-50-8	COPPER	4.86	U		P	3
7439-89-6	IRON	194			P	3
7439-92-1	LEAD	3.27	U		P	3
7439-95-4	MAGNESIUM	754000			P	3
7439-96-5	MANGANESE	72.5			P	3
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	39.63	U		P	3
7440-09-7	POTASSIUM	254000			P	1
7782-49-2	SELENIUM	7.71	U		P	3
7440-22-4	SILVER	7.62	U		P	3
7440-23-5	SODIUM	6380000			P	20
7440-28-0	THALLIUM	13.47	U		P	3
7440-62-2	VANADIUM	10.74	U		P	3
7440-66-6	ZINC	15.9	В		P	3



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-3

SDG:

WP3906 10/6/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date	Analyzed	1: 9/2	23/99

Sample Description	Matrix 3	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0701	QA	9/10/99	9/14/99	9/16/99	LAP	EPA 3510	KRT
Compound	Result Units		DF	Sample PQL	Method PQL		
NAPHTHALENE	<10	ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10		
ACENAPHTHYLENE	<10	ug/L	1.0	10	10		
ACENAPHTHENE	<10	ug/L	1.0	10	10		
FLUORENE	<10	ug/L	1.0	10	10		
PHENANTHRENE	<10	ug/L	1.0	10	10		
ANTHRACENE	<10	ug/L	1.0	10	10		
FLUORANTHENE	<10	ug/L	1.0	10	10		
PYRENE	<10	ug/L	1.0	10	10		
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10		
CHRYSENE	<10	ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO[A]PYRENE	<10	ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10		
DIBENZ(A,H)ANTHRACENE	<10	ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10		
NITROBENZENE-D5	101	%	1.0				
2-FLUOROBIPHENYL	90	%	1.0				
TERPHENYL-D14	56	%	1.0				



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-3

SDG:

WP3906

Report Date: PO No. :

10/12/99

Project:

N7912-P99264 CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed: 9/15/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0701	AQ 9/10/99		9/14/99	9/15/99	НМР	5030	НМР
Compound	Res	ult Units	DF	Sample PQL	Method PQL		
BENZENE	<5	5 ug/L	1.0	5	5		
TOLUENE	<5	5 ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<5	5 ug/L	1.0	5	5		
ETHYLBENZENE	<5	5 ug/L	1.0	5	5		
NAPHTH A LENE	<5	5 ug/L	1.0	5	5		
MTBE	<5	5 ug/L	1.0	5	5		
TOTAL XYLENES	<5	5 ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE	95	5 %	1.0				
1,2-DICHLOROETHANE-D4	84	1 %	1.0				
OLUENE-D8	98	3 %	1.0				
-BROMOFLUOROBENZENE	99	%	1.0				

Lab Name: Katahdin Analytical Services Client Field ID: 36GLM0401

Matrix: WATER SDG Name: WP3906

Percent Solids: 0.00 Lab Sample ID: WP3906-004

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	84.6	В		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	2.07	U		P	1
7440-39-3	BARIUM	24.8			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		· P	1
7440-70-2	CALCIUM	119000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	294			P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	51400			P	1
7439-96-5	MANGANESE	57.2			P	1
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	13.21	U		P	l
7440-09-7	POTASSIUM	30400			P	1
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	Ų		P	1
7440-23-5	SODIUM	299000			P	1
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	12.9	В		P	1



Client: Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-4

SDG:

WP3906 10/6/99

Report Date: PO No. :

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/27/99

Sample Description	Matrix S	ampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst	
36GLM0401	AQ	9/10/99	9/14/99	9/16/99	LAP	EPA 3510	sw	
Compound	Resu	lt Units	DF	Sample PQL	Method PQL			
NAPHTHALENE	<10	ug/L	1.0	10	10			
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10			
ACENAPHTHYLENE	<10	ug/L	1.0	10	10			
ACENAPHTHENE	<10	ug/L	1.0	10	10			
FLUORENE	<10	ug/L	1.0	10	10			
PHENANTHRENE	<10	ug/L	1.0	10	10			
ANTHRACENE	<10	ug/L	1.0	10	10			
FLUORANTHENE	<10	ug/L	1.0	10	10			
PYRENE	<10	ug/L	1.0	10	10			
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10			
CHRYSENE	<10	ug/L	1.0	10	10			
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10			
BENZO[K]FLUORANTHENE	<10	ug/L	1.0	10	10			
BENZO[A]PYRENE	<10	ug/L	1.0	10	10			
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10			
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10			
BENZO(G,H,I)PERYLENE	<10	ug/L	1.0	10	10			
NITROBENZENE-D5	74	%	1.0					
2-FLUOROBIPHENYL	88	%	1.0					
TERPHENYL-D14	104	%	1.0					



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-4

SDG:

WP3906 10/12/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed: 9/15/99

Sample Description	Matrix	Sampled Date		Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0401	AQ 9/10/99		9/14/99	9/15/99	HMP	5030	НМР	
Compound	Re	suit	Units	DF	Sample PQL	Method PQL		
BENZENE		<5	ug/L	1.0	5	5		
TOLUENE		<5	ug/L	1.0	5	5		
1,2-DIBROMOETHANE		<5	ug/L	1.0	5	5		
ETHYLBENZENE		J4	ug/L	1.0	5	5		
NAPHTHALENE	В	13	ug/L	1.0	5	5		
MTBE	4	: 5	ug/L	1.0	5	5		
TOTAL XYLENES		6	ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE	ş	93	%	1.0				
1,2-DICHLOROETHANE-D4	8	31	%	1.0				
TOLUENE-D8	1	00	%	1.0				
P-BROMOFLUOROBENZENE	1	00	%	1.0				

Report Notes: B, J

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0501

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-005

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	37.0	В		P	1
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	2.07	U		P	1
7440-39-3	BARIUM	19.8			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	105000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	398			P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	39800			P	1
7439-96-5	MANGANESE	75.5			P	1
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	23800			P	l
7782-49-2	SELENIUM	2.57	U		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	202000			P	1
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	9.7	В		P	1



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-5

SDG:

WP3906 10/6/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/23/99

Sample Description	Matrix Sampled Date AQ 9/10/99		ate Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0501			9/14/99	9/16/99	LAP	EPA 3510	
Compound	Re	sult U	nits DF	Sample PQL	Method PQL		
NAPHTHALENE	<	10 ug/L	. 1.0	10	10		
2-METHYLNAPHTHALENE	<	10 ug/L	. 1.0	10	10		
ACENAPHTHYLENE	<	10 ug/L	. 1.0	10	10		
ACENAPHTHENE	<	10 ug/L	. 1.0	10	10		
FLUORENE	<	10 ug/L	. 1.0	10	10		
PHENANTHRENE	<	10 ug/L	. 1.0	10	10		
ANTHRACENE	<	10 ug/L	. 1.0	10	10		
FLUORANTHENE	<	10 ug/L	. 1.0	10	10		
PYRENE	<	10 ug/L	1.0	10	10		
BENZO[A]ANTHRACENE	<	10 ug/L	. 1.0	10	10		
CHRYSENE	<	10 ug/L	. 1.0	10	10		
BENZO[B]FLUORANTHENE	<	10 ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<	10 ug/L	1.0	10	10		
BENZO[A]PYRENE	<	10 ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<	10 ug/L	1.0	10	10		
DIBENZ[A,H]ANTHRACENE	<	10 ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<	10 ug/L	1.0	10	10		
NITROBENZENE-D5	9	_	% 1.0				
2-FLUOROBIPHENYL	1-	00 (% 1.0				
TERPHENYL-D14	1	01 4	% 1.0				



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-5

SDG:

WP3906

Report Date:

10/12/99

PO No. : Project: N7912-P99264

r roject.

CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed: 9/15/99

Sample Description	Matrix Sampled Date		Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst	
36GLM0501	AQ	AQ 9/10/99		9/14/99	9/15/99	НМР	5030	HMP
Compound	Resu		Units	DF	Sample PQL	Method PQL		
BENZENE		<5	ug/L	1.0	5	5		
TOLUENE		<5	ug/L	1.0	5	5		
1,2-DIBROMOETHANE		<5	ug/L	1.0	5	5		
ETHYLBENZENE		<5	ug/L	1.0	5	5		
NAPHTHALENE		<5	ug/L	1.0	5	5		
MTBE		<5	ug/L	1.0	5	5		
TOTAL XYLENES		<5	ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE		93	%	1.0				
1,2-DICHLOROETHANE-D4		83	%	1.0				
TOLUENE-D8		100	%	1.0				
P-BROMOFLUOROBENZENE		98	%	1,0				

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0201D

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-014

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF	
7429-90-5	ALUMINUM	45.2	В		P	1	
7440-36-0	ANTIMONY	1.81	U		P	1	
7440-38 - 2	ARSENIC	2.07	U		P	1	
7440-39-3	BARIUM	27.5			P	1	
7440-41-7	BERYLLIUM	0.33	U		P	1	
7440-43-9	CADMIUM	1.94	U		P	1	
7440-70-2	CALCIUM	109000			P	1	
7440-47-3	CHROMIUM	4.31	U		P	1	
7440-48-4	COBALT	4.45	U		P	1	
7440-50-8	COPPER	1.62	U		P	1	
7439-89-6	IRON	99.4			P	ı	
7439-92-1	LEAD	1.09	U		P	ı	
7439-95-4	MAGNESIUM	46600			P	I	
7439-96-5	MANGANESE	37.1			P	1	
7439-97-6	MERCURY	0.03	В		CV	1	
7440-02-0	NICKEL	13.21	U		P	1	
7440-09-7	POTASSIUM	26700			P	1	
7782-49-2	SELENIUM	2.57	U		P	I	
7440-22-4	SILVER	2.54	U		P	1	
7440-23-5	SODIUM	260000			P	1	
7440-28-0	THALLIUM	4.49	U		P	1	
7440-62-2	VANADIUM	3.58	U		P	1	
7440-66-6	ZINC	6.2	В		P	1	



Client:

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Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-14

SDG:

WP3906

Report Date: PO No. :

10/6/99

Project:

N7912-P99264

% Solids:

CTO #68 N/A

Method:

EPA 8270

Date Analyzed: 9/29/99

EFA 0210

Sample Description	Matrix :	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0201D	AQ 9/13/99		9/14/99	9/20/99	DS	EPA 3510	KRT
Compound	Resu	uit Units	DF	Sample PQL	Method PQL		<u> </u>
NAPHTHALENE	13	ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<10) ug/L	1.0	10	10		
ACENAPHTHYLENE	<10	ug/L	1.0	10	10		
ACENAPHTHENE	<10	ug/L	1.0	10	10		
FLUORENE	<10) ug/L	1.0	10	10		
PHENANTHRENE	<10	ug/L	1.0	10	10		
ANTHRACENE	<10	_	1.0	10	10		
FLUORANTHENE	<10		1.0	10	10		
PYRENE	<10	ug/L	1.0	10	10		
ENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10		
CHRYSENE	<10	ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10		1.0	10	10		
BENZO[K]FLUORANTHENE	<10	-	1.0	10	10		
BENZO[A]PYRENE	<10	=	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10		
DIBENZ[A,H]ANTHRACENE	<10	-	1.0	10	10		
BENZO[G,H,I]PERYLENE	<10	_	1.0	10	10		
NITROBENZENE-D5	62	%	1.0				
2-FLUOROBIPHENYL	69	%	1.0				
TERPHENYL-D14	71	%	1.0				

.keport Notes:



Paul Calligan Client:

> Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-14

SDG: Report Date: WP3906 10/12/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

Method:

SW8260

Date Analyzed: 9/16/99

Sample Description	Matrix	Samp	led Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0201D	AQ 9/13/99		9/14/99	9/16/99	HMP	5030	HMP	
Compound	Re	sult	Units	DF	Sample PQL	Method PQL		
BENZENE		<5	ug/L	1.0	5	5	•	
TOLUENE		<5	ug/L	1.0	5	5		
1,2-DIBROMOETHANE	•	<5	ug/L	1.0	5	5		
ETHYLBENZENE	•	<5	ug/L	1.0	5	5		
NAPHTHALENE	6	36	ug/L	1.0	5	5		
MTBE	•	<5	ug/L	1.0	5	5		
TOTAL XYLENES		<5	ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE	!	91	%	1.0				
1,2-DICHLOROETHANE-D4	{	80	%	1.0				
TOLUENE-D8	9	98	%	1.0				
P-BROMOFLUOROBENZENE	9	99	%	1.0				

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0601

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-028

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF	
7429-90-5	ALUMINUM	28.6	В		P	1	
7440-36-0	ANTIMONY	1.81	U		P	1	
7440-38-2	ARSENIC	39.7			P	I	
7440-39-3	BARIUM	12.0			P	1	
7440-41-7	BERYLLIUM	0.33	U		P	1	
7440-43-9	CADMIUM	1.94	U		P	1	
7440-70-2	CALCIUM	116000			P	1	
7440-47-3	CHROMIUM	4.31	U		P	1	
7440-48-4	COBALT	4.45	U		P	1	
7440-50-8	COPPER	1.62	U		P	ı	
7439-89 - 6	IRON	2530			P	1	
7439-92-1	LEAD	2.0	В		P	l	
7439-95-4	MAGNESIUM	56400			P	1	
7439-96-5	MANGANESE	51.1			P	1	
7439-97-6	MERCURY	0.02	U		CV	1	
7440-02-0	NICKEL	17.8	В		P	1	
7440-09-7	POTASSIUM	38000			P	l	
7782-49-2	SELENIUM	2.57	U		P	1	
7440-22-4	SILVER	2.54	U		P	1	
7440-23-5	SODIUM	450000			P	1	
7440-28-0	THALLIUM	4.49	U		P	1	
7440-62-2	VANADIUM	3.58	U		P	1	
7440-66-6	ZINC	5.0	В		P	1	



CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number: WP-3906-28

Report Date: 10/13/99

PO No. : N7912-P99264 Project : CTO #68

WICH: ONC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 1 of 9

SAMPLE DESCRIPTION	TAM	RIX		SAMPLED I	ву	SAMPLED I	ATE	RECEIVED	
36GLMD601	Aqu	Aquecus			p.HALVERSON/ T.THOMPSON/ J.KRIBGER		9	09/14/99	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES	
Nitrate as N Sulfate	<0.050 480.	mg/L mg/L	1.0 40		353.2 375.4	09/14/99 10/04/99	KW LT		

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/13/99

LJO/baeajc(dw)/msm PI14NOW1

CC: MS. LEE LECK
TETRA TECH NUS
FOSTER PLAZA 7
661 ANDERSEN DR.



`lient:

Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-28

SDG:

WP3906

Report Date:

10/6/99

PO No. :

N7912-P99264

Project: % Solids: CTO #68 N/A

Method:

EPA 8270

Date	Analyzed:	9/28/99

Sample Description	Matrix Sa	mpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0601	AQ	9/13/99	9/14/99	9/17/99	D PD	EPA 3510	sw
Compound	Result	Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	<10	ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10		
ACENAPHTHYLENE	<10	ug/L	1.0	10	10		
ACENAPHTHENE	<10	ug/L	1.0	10	10		
FLUORENE	<10	u g/L	1.0	10	10		
PHENANTHRENE	<10	ug/L	1.0	10	10		
ANTHRACENE	<10	ug/L	1.0	10	10		
FLUORANTHENE	<10	ug/L	1.0	10	10		
TYRENE	<10	ug/L	1.0	10	10		
ENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10		
CHRYSENE	<10	ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<10	u g∕L	1.0	10	10		
BENZO[A]PYRENE	<10	ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10		
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10		
NITROBENZENE-D5	58	%.	1.0				
2-FLUOROBIPHENYL	76	%	1.0				
TERPHENYL-D14	70	%	1.0				



Client:

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Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-28

SDG:

WP3906

Report Date: PO No.:

10/12/99 N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed: 9/17/99

Sample Description	Matrix	Sam	pled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst	
36GLM0601	AQ	AQ 9/13/99		9/14/99	9/17/99	KMC	5030	КМС	
Compound	Re	esult	Units	DF	Sample PQL	Method PQL			
BENZENE		<5	ug/L	1.0	5	5			
TOLUENE		<5	ug/L	1.0	5	5			
1,2-DIBROMOETHANE		<5	ug/L	1.0	5	5			
ETHYLBENZENE		<5	ug/L	1.0	5	5			
NAPHTHALENE		<5	ug/L	1.0	5	5			
MTBE		<5	ug/L	1.0	5	5			
TOTAL XYLENES		<5	ug/L	1.0	5	5			
DIBROMOFLUOROMETHANE		91	%	1.0					
1,2-DICHLOROETHANE-D4		80	%	1.0					
TOLUENE-D8		95	%	1.0					
P-BROMOFLUOROBENZENE		88	%	1.0					

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0201

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-029

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	C	Q	M	DF
7429-90-5	ALUMINUM	29.5	В		P	ì
7440-36-0	ANTIMONY	1.81	U		P	1
7440-38-2	ARSENIC	2.07	U		P	1
7440-39-3	BARIUM	27.1			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	112000			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439 - 89-6	IRON	105			P	1
7439-92-1	LEAD	1.09	U		P	1
7439-95-4	MAGNESIUM	46000			P	1
7439-96-5	MANGANESE	39.8			P	1
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	13.21	U		P	1
7440-09-7	POTASSIUM	26800			P	1
7782 - 49-2	SELENIUM	2.57	U		Ρ .	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	260000			P	1
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	3.1	В		P	1



Lab Number : WP-3906-29

Report Date: 10/13/99 PO No. : N7912-P99264

Project

: CTO #68

CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

WIC#: CNC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 2 of 9

SAMPLE DESCRIPTION	MAI	RIX		SAMPLED	ву	SAMPLED D	ATE	RECEIVED
36GIMD201	Acqu	iècus		P.HALVER T.THOMPS J.KRIEGE	ORT/	09/13/9	9	09/14/99
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES
Nitrate as N Sulfate	0.060 17.	mg/L mg/L	1.0 1.0		353.2 300.0		KW CF	

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect samplespecific reporting limits. Sample-specific limits are indicated by results annotated with '<' value.

10/13/99

LJO/baeajc(dw)/msm PI14NOW1

CC: MS. LEE LECK TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



∩lient;

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-29

SDG:

WP3906

Report Date:

10/6/99

PO No.:

N7912-P99264

Project: % Solids: CTO #68 N/A

Method:

EPA 8270

Date Analyzed: 9/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0201	AQ	9/13/99	9/14/99	9/17/99	DPD	EPA 3510	SW
Compound	Re	sult Units	DF	Sample PQL	Method PQL		
NAPHTHALENE	J	9 ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<	10 ug/L	1.0	10	10		
ACENAPHTHYLENE	<	10 ug/L	1.0	10	10		
ACENAPHTHENE	<	10 ug/L	1.0	10	10		
FLUORENE	<	10 ug/L	1.0	10	10		
PHENANTHRENE	<	10 ug/L	1.0	10	10		
ANTHRACENE	<	10 ug/L	1.0	10	10		
FLUORANTHENE	<	10 ug/L	1.0	10	10		
PYRENE	<	10 ug/L	1.0	10	10		
ENZO[A]ANTHRACENE	<	10 ug/L	1.0	10	10		
CHRYSENE	<	10 ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<	10 ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<1	lO ug/L	1.0	10	10		
BENZO[A]PYRENE	<1	10 ug/L	1.0	10	10		*
INDENO 1,2,3-CD]PYRENE	<1	IO ug/L	1.0	10	10		
DIBENZ(A,H)ANTHRACENE	<1	10 ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<1	10 ug/L	1.0	10	10		
NITROBENZENE-D5	5	9 %	1.0				
2-FLUOROBIPHENYL	6	8 %	1.0				
TERPHENYL-D14	6	9 %	1.0	-			



Client:

Paul Calligan

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Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-29

SDG:

WP3906

Report Date: PO No.:

10/12/99 N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed: 9/17/99

Sample Description	Matrix Sa	mpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0201	AQ 9/13/99		9/14/99	9/17/99	кмс	5030	КМС
Compound	Result	Units	DF	Sample PQL	Method PQL		
BENZENE	<5	ug/L	1.0	5	5		
TOLUENE	J3	ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5		
ETHYLBENZENE	<5	ug/L	1.0	5	5		
NAPHTHALENE	9	ug/L	1.0	5	5		
MTBE	<5	ug/L	1.0	5	5		
TOTAL XYLENES	J3	ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE	91	%	1.0				
1,2-DICHLOROETHANE-D4	81	%	1.0				
TOLUENE-D8	97	%	1.0				
P-BROMOFLUOROBENZENE	98	%	1.0				

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0301

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample 1D: WP3906-030

Concentration Units (ug/L or mg/Kg dry weight): ug/L

CAS No.	Analyte	Concentration	С	Q	M	DF
7429-90-5	ALUMINUM	28.1	В		P	1
7440-36-0	ANTIMONY	1.81	U	•	P	1
7440-38-2	ARSENIC	2.07	υ		P	ĭ
7440-39-3	BARIUM	42.9			P	1
7440-41-7	BERYLLIUM	0.33	U		P	1
7440-43-9	CADMIUM	1.94	U		P	1
7440-70-2	CALCIUM	98400			P	1
7440-47-3	CHROMIUM	4.31	U		P	1
7440-48-4	COBALT	4.45	U		P	1
7440-50-8	COPPER	1.62	U		P	1
7439-89-6	IRON	47.1	В		P	1
7439-92-1	LEAD	2.0	В		P	1
7439-95-4	MAGNESIUM	56600			P	1
7439-96-5	MANGANESE	22.6			P	1
7439-97-6	MERCURY	0.02	U		CV	1
7440-02-0	NICKEL	13.21	U		P	i
7440-09-7	POTASSIUM	38200			P	1
7782-49-2	SELENIUM	2.57	υ		P	1
7440-22-4	SILVER	2.54	U		P	1
7440-23-5	SODIUM	435000			P	1
7440-28-0	THALLIUM	4.49	U		P	1
7440-62-2	VANADIUM	3.58	U		P	1
7440-66-6	ZINC	1.09	υ		P	1



CLIENT: Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr., Suite 102

Tallahassee, FL 32308

Lab Number : WP-3906-30

Report Date: 10/13/99

PO No.

: N7912-P99264

Project

: CTO #68

WICH: ONC CHARLESTON

REPORT OF ANALYTICAL RESULTS

Page 3 of 9

SAMPLE DESCRIPTION	MAI	MATRIX			BY	SAMPLED DATE RECEIVED			
36GLM0301	, Aqu	eous		P.HALVER T.THOMPS J.KRIEGE	OBN/	09/13/9	9	09/14/99	
PARAMETER	RESULT	UNITS	DF	*PQL	METHOD	ANALYZED	BY	NOTES	
Nitrate as N Sulfate	<0.050 11.	mg/L mg/L	1.0		353.2 300.0	09/14/99 09/24/99	KW CIF		

^{*} PQL (Practical Quantitation Level) represents laboratory reporting limits and may not reflect sample-specific reporting limits. Sample-specific limits are indicated by results annotated with '<' values.

10/13/99

LJO/baeajc(dw)/msm PI14NOW1

CC: MS. LEE LECK TETRA TECH NUS FOSTER PLAZA 7 661 ANDERSEN DR.



`lient:

Paul Calligan

Tetra Tech NUS

1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-30

SDG:

WP3906

Report Date:

10/6/99

PO No. :

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/28/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0301	AQ	9/13/99	9/14/99	9/17/99 Sample PQL	DPD Method PQL	EPA 3510	sw
Compound	Res	sult Units	DF				
NAPHTHALENE	<1	10 ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<	10 ug/ L	1.0	10	10		
ACENAPHTHYLENE	<1	10 ug/L	1.0	10	10		
ACENAPHTHENE	<	l0 ug/L	1.0	10	10		
FLUORENE	<1	10 ug/L	1.0	10	10		
PHENANTHRENE	<1	10 ug/L	1.0	10	10		
ANTHRACENE	<1	10 ug/L	1.0	10	10		
FLUORANTHENE	<1	l0 ug/L	1.0	10	10		
YRENE	<1	0 ug/L	1.0	10	10		
JENZO[A]ANTHRACENE	<1	10 ug/L	1.0	10	10		
CHRYSENE	<1	0 ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	. <1	l0 ug/L	1.0	10	10		
BENZO(K)FLUORANTHENE	<1	0 ug/L	1.0	10	10		
BENZO[A]PYRENE	<1	10 ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<1	10 ug/L	1.0	10	10		
DIBENZ[A,H]ANTHRACENE	<1	0 ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<1	l0 ug/L	1.0	10	10		
NITROBENZENE-D5	6	3 %	1.0				
2-FLUOROBIPHENYL	6		1.0				
TERPHENYL-D14	6	1 %	1.0				



Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

WP3906-30

SDG:

WP3906

Report Date:

10/12/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

SW8260

Date Analyzed: 9/30/99

Sample Description	Matrix	Samp	led Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
36GLM0301	ΔQ	9/1	13/99	9/14/99	9/30/99	JSS	5030	JSS
Compound	Re	sult	Units	DF	Sample PQL	Method PQL		
BENZENE		<5	ug/L	1.0		5		
TOLUENE		<5	ug/L	1.0	5	5		
1,2-DIBROMOETHANE		<5	ug/L	1.0	5	5		
ETHYLBENZENE		<5	ug/L	1.0	5	5		
NAPHTHALENE		<5	ug/L	1.0	5	5		
MTBE		<5	ug/L	1 .0	5	5		
TOTAL XYLENES		<5	ug/L	1.0	5	- 5		
DIBROMOFLUOROMETHANE	1	09	%	1.0				
1,2-DICHLOROETHANE-D4	1	80	%	1.0				
TOLUENE-D8	1	02	%	1.0				
P-BROMOFLUOROBENZENE	1	03	%	1.0				

3P PREPARATION BLANKS

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI17ICW0

Matrix: WATER

SDG Name: WP3906

QC Batch ID: PI171CW0

Concentration Units (ug/L or mg/Kg dry weight): ug/L

		_	
Analyte	RESULT	С	
ALUMINUM	39.210	В	
ANTIMONY	I.810	U	
ARSENIC	2.070	U	
BARIUM	0.480	U	
BERYLLIUM	0.330	U	
CADMIUM	1.940	U	
CALCIUM	40.460	В	
CHROMIUM	4.310	U	
COBALT	4.450	U	
COPPER	1.620	U	
IRON	11.980	В	
LEAD	1.090	U	
MAGNESIUM	17.160	U	
MANGANESE	0.970	U	
NICKEL	13.210	U	
POTASSIUM	449.540	U	
SELENIUM	2.570	U	
SILVER	2.540	U	
SODIUM	67.270	В	
THALLIUM	4.490	U	
VANADIUM	3.580	U	
ZINC	6.750	В	

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI21ICW0

Matrix: WATER

SDG Name: WP3906

QC Batch ID: P1211CW0

Analyte	RESULT	C	_
ALUMINUM	18.610	В	
ANTIMONY	1.810	U	
ARSENIC	2.070	U	
BARIUM	0.590	В	
BERYLLIUM	0.330	U	
CADMIUM	1.940	Ū	
CALCIUM	14.650	U	
CHROMIUM	4.310	U	
COBALT	4.450	U	
COPPER	1.620	U	
IRON	6.310	В	
LEAD	1.090	υ	
MAGNESIUM	17.160	U	
MANGANESE	0.970	U	
NICKEL	13.210	U	
POTASSIUM	449.540	U	
SELENIUM	2.570	U	
SILVER	2.540	υ	
SODIUM	79.890	В	
THALLIUM	4.490	U	
VANADIUM	3.580	U	
ZINC	2.880	В	

Lab Name: Katahdin Analytical Services

Sample ID: PBWPI22HGW0

Matrix: WATER

SDG Name: WP3906

QC Batch ID: PI22HGW0

Analyte	RESULT	C
MERCURY	-0.037	В

Lab Name: Katahdin Analytical Services Sample ID: PBWPI25HGW0

Matrix: WATER SDG Name: WP3906

QC Batch ID: PI25HGW0

Analyte	RESULT	С
MERCURY	0.020	U

Lab Name: Katahdin Analytical Services Sample ID: PBWP127HGW0

Matrix: WATER SDG Name: WP3906

QC Batch ID: PI27HGW0

Analyte	RESULT	С	
MERCURY	-0.083	В	

Lab Name: Katahdin Analytical Services Sample ID: PBWPI22ICW0

Matrix: WATER SDG Name: WP3906

QC Batch ID: PI22ICW0

Analyte	RESULT	С	
LEAD	1.090	U	

Lab Name: Katahdin Analytical Services Sample ID: LCSWPI171CW0

Matrix: WATER SDG Name: WP3906

QC Batch ID: P1171CW0

Analyte	TRUE	FOUND	% R	LIMIT	5 (%)
ALUMINUM	2000.0	2030.24	101.5	80	120
ANTIMONY	500.0	527.73	105.5	80	120
ARSENIC	2000.0	2042.49	102.1	80	120
BARIUM	2000.0	2119.41	106.0	80	120
BERYLLIUM	50.0	52.48	105.0	80	120
CADMIUM	50.0	51.24	102.5	80	120
CALCIUM	2500.0	2520.87	100.8	80	120
CHROMIUM	200.0	214.61	107.3	80	120
COBALT	500.0	535.11	107.0	80	120
COPPER	250.0	253.62	101.4	80	120
IRON	1000.0	1074.06	107.4	80	120
LEAD	500.0	578.81	115.8	80	120
MAGNESIUM	5000.0	4935.47	98.7	80	120
MANGANESE	500.0	527.89	105.6	80	120
NICKEL	500.0	550.33	110.1	80	120
POTASSIUM	25000.0	24754.48	99.0	80	120
SELENIUM	2000.0	1940.17	97.0	80	120
SILVER	50.0	46.85	93.7	80	120
SODIUM	7500.0	7279.53	97.1	80	120
THALLIUM	2000.0	2383.07	119.2	80	120
VANADIUM	500.0	524.97	105.0	80	120
ZINC	500.0	491.13	98.2	80	120

Lab Name: Katahdin Analytical Services

Sample ID: LCSWP1211CW0

Mairix: WATER

SDG Name: WP3906

QC Batch ID: PI211CW0

Analyte	TRUE	FOUND	% R	LIMIT	'S (%)
ALUMINUM	2000.0	1959.02	98.0	80	120
ANTIMONY	500.0	505.31	101.1	80	120
ARSENIC	2000.0	2043.06	102.2	80	120
BARIUM	2000.0	2091.69	104.6	80	120
BERYLLIUM	50.0	51.78	103.6	80	120
CADMIUM	50.0	47.87	95.7	80	120
CALCIUM	2500.0	2433.76	97.4	80	120
CHROMIUM	200.0	207.57	103.8	80	120
COBALT	500.0	519.44	103.9	80	120
COPPER	250.0	249.99	100.0	80	120
1RON	1000.0	1039.34	103.9	80	120
LEAD	500.0	560.24	112.0	80	120
MAGNESIUM	5000.0	4781.75	95.6	80	120
MANGANESE	500.0	516.28	103.3	80	120
NICKEL	500.0	521.70	104.3	80	120
POTASSIUM	25000.0	24231.93	96.9	80	120
SELENIUM	2000.0	1910.79	95.5	80	120
SILVER	50.0	44.67	89.3	80	120
SODIUM	7500.0	7270.91	96.9	80	120
THALLIUM	2000.0	2247.69	112.4	80	120
VANADIUM	500.0	513.99	102.8	80	120
ZINC	500.0	489.12	97.8	80	120

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LABORATORY CONTROL SAMPLES

Lab Name: Katahdin Analytical Services

Sample ID: LCSWPI22HGW0

Matrix: WATER

SDG Name: WP3906

QC Batch ID: PI22HGW0

Analyte	TRUE	FOUND	% R	LIMITS (%)
MERCURY	5.0	5.09	101.8	80 120

Lab Name: Katahdin Analytical Services

Sample ID: LCSWPI25HGW0

Matrix: WATER

SDG Name: WP3906

QC Batch ID: PI25HGW0

Analyte	TRUE	FOUND	% R	LIMITS (%)
MERCURY	5.0	4.86	97.2	80 120

Lab Name: Katahdin Analytical Services Sample ID: LCSWPI27HGW0

Matrix: WATER SDG Name: WP3906

QC Batch ID: PI27HGW0

Analyte	TRUE	FOUND	% R	LIMIT	S (%)
MERCURY	5.0	4.76	95.2	80	120

Lab Name: Katahdin Analytical Services Sample ID: LCSWP1221CW0

Matrix: WATER SDG Name: WP3906

QC Batch ID: PI22ICW0

Analyte	TRUE	FOUND	% R	LIMITS (%)
LEAD	500.0	552.13	110.4	80 120

Lab Name: Katahdin Analytical Services

Client Field ID: 42GLM1001S

WP3906

Matrix: WATER

SDG Name:

Percent Solids: 0.00

Lab Sample ID: WP3906-019S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked		Spiked Sample Spike				Control Limits (%R)			
Analyte	Sample Result C	Result	C	Added	%R	Q	Low	High	M	
ALUMINUM	2049.9500	98.2000	В	2000	97.6		75	125	P	
ANTIMONY	515.6800	1.0200	U	500	103.1		75	125	P	
ARSENIC	2094.7600	44.3600		2000	102.5		75	125	P	
BARIUM	2157.7700	57.8600		2000	105.0		75	125	P	
BERYLLIUM	53.1500	-0.1200	U	50	106.3		75	125	P	
CADMIUM	53.1900	-1.0700	U	50	106.4		75	125	P	
CALCIUM	189115.2000	187419.5200		2500	67.8		75	125	P	
CHROMIUM	203.9800	-2.1400	U	200	102.0		75	125	P	
COBALT	515.0200	1.6800	U	500	103.0		75	125	P	
COPPER	251.5900	0.1900	U	250	100.6		75	125	P	
IRON	39509.6600	38350.5100		1000	115.9		75	125	P	
LEAD	529.5300	0.5600	U	500	105.9		. 75	125	P	
MAGNESIUM	25346.4100	20264.8800		5000	101.6		75	125	P	
MANGANESE	2296.6900	1794.6800		500	100.4		75	125	P	
MERCURY	0.9500	0.1170	В	1	83.3		75	125	CV	
NICKEL	529.0100	6.8200	U	500	105.8	.,	75	125	P	
POTASSIUM	44841.8100	19420.0900	-	25000	101.7		75	125	₽.	
SELENIUM	1928.2000	0.7900	U	2000	96.4		75	125	P	
SILVER	47.5600	1.7800	U	50	95.1		75	125	P	
SODIUM	47083.9400	38704.0700		7500	111.7		75	125	P	
THALLIUM	2082.1200	0.8300	U	2000	104.1		75	125	P	
VANADIUM	518.9700	-2.8900	·U	500	103.8		75	125	P	
ZINC	503.1400	7.7700	В	500	99.1		75	125	P	

Lab Name: Katahdin Analytical Services

Client Field ID: 42GLM1001S

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-019P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked	Sample		Spike			Control Lir	nits (%R)	
Analyte	Sample Result C	Result	C	Added	%R	Q	Low	High	M
ALUMINUM	2046.3300	98,2000	В	2000	97.4		75	125	P
ANTIMONY	505.6200	1.0200	U	500	101.1		75	125	P
ARSENIC	2057.9800	44.3600		2000	100.7		75	125	P
BARIUM	2110.5300	57.8600		2000	102.6		75	125	P
BERYLLIUM	52.1700	-0.1200	U	50	104.3		75	125	P
CADMIUM	49.9000	-1.0700	U	50	99.8		75	125	P
CALCIUM	184855.5200	187419.5200		2500	-102.6		75	125	P
CHROMIUM	198.6300	-2.1400	U	200	99.3		75	125	P
COBALT	508.7000	1.6800	U	500	101.7		75	125	P
COPPER	248.5400	0.1900	U	250	99,4		75	125	P
IRON	38525.0000	38350.5100		1000	17.4		75	125	P
LEAD	521.0000	0.5600	U	500	104.2		75	125	P
MAGNESIUM	24687.3600	20264.8800		5000	88.4		75	125	P
MANGANESE	2255.1100	1794.6800		500	92.1		75	125	P
MERCURY	0.9980	0.1170	В	1	88.1		75	125	CV
NICKEL	528.0300	6.8200	U	500	105.6		75	125	P
POTASSIUM	43590.4700	19420.0900		25000	96.7		75	125	P
SELENIUM	1898.3400	0.7900	U	2000	94.9		75	125	P
SILVER	45.4200	1.7800	U	50	90.8		75	125	P
SODIUM	45438.8800	38704.0700		7500	89.8		75	125	P
THALLIUM	2038.9500	0.8300	U	2000	101.9		75	125	P
VANADIUM	511.2300	-2.8900	U	500	102.2		75	125	P
ZINC	494.7600	7.7700	В	500	97.4		75	125	P

Lab Name: Katahdin Analytical Services

Client Field ID: 36GLM0101S

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-001S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked	Sample Spike Control Limits (%							
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M		
MERCURY	1.0600	0.0000 U	l	106.0	75	125	CV		

Lab Name: Katahdin Analytical Services

Client Field ID: 42GLM0801S

Matrix: WATER

SDG Name:

Percent Solids: 0.00

Lab Sample ID: WP3906-021S

WP3906

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked	Sample	Spike		Control Lin		
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M
MERCURY	1.0700	-0.0190 U	1	107.0	75	125	CV

Lab Name: Katahdin Analytical Services

Client Field ID: 42GLM0801S

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-021P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked	Sample	Spike		Control Limits (%R)					
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M			
MERCURY	1.0800	-0.0190 U	1	108.0	75	125	cv			

Lab Name: Katahdin Analytical Services

Client Field ID: 25GLM0701S

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-046S

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked	Sample	Spike		Control Limits (%R)				
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M		
LEAD	538.0900	0.6200 U	500	107.6	75	125	P		

Lab Name: Katahdin Analytical Services

Client Field ID: 25GLM0701S

Matrix: WATER

SDG Name: WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-046P

Concentration Units (ug/L or mg/Kg dry weight): ug/L

	Spiked	Sample	Spike		Control Limits (%R)						
Analyte	Sample Result C	Result C	Added	%R Q	Low	High	M				
LEAD	504.6900	0.6200 U	500	100.9	75	125	P				

5D SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Client Field ID: 42GLM1001

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-019

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result	C Spike Dup. Result C	RPD Q	M
ALUMINUM		2049.9500	2046.3300	0.2	P
ANTIMONY		515.6800	505.6200	2.0	P
ARSENIC		2094.7600	2057.9800	1.8	P
BARIUM		2157.7700	2110.5300	2.2	P
BERYLLIUM		53.1500	52.1700	1.9	P
CADMIUM	10	53.1900	49.9000	6.4	P
CALCIUM		189115.2000	184855.5200	2.3	P
CHROMIUM		203.9800	198.6300	2.7	P
COBALT		515.0200	508.7000	1.2	P
COPPER		251.5900	248.5400	1.2	P
IRON		39509.6600	38525.0000	2.5	P
LEAD		529.5300	521.0000	1.6	P
MAGNESIUM		25346.4100	24687.3600	2.6	P
MANGANESE		2296,6900	2255.1100	1.8	P
MERCURY	0.2	0.9500	0.9980	4.9	CV
NICKEL		529.0100	528.0300	0.2	P
POTASSIUM		44841.8100	43590.4700	2.8	P
SELENIUM		1928.2000	1898.3400	1.6	P
SILVER	15	47.5600	45.4200	4.6	P
SODIUM		47083.9400	45438.8800	3.6	P
THALLIUM		2082.1200	2038.9500	2.1	P
VANADIUM		518.9700	511.2300	1.5	P
ZINC		503.1400	494.7600	1.7	P

5D SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Client Field ID: 42GLM0801

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-021

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result C	Spike Dup. Result C	RPD	Q M	
MERCURY		1.0700	1.0800	0.9	CV	

5D SPIKE DUPLICATES

Lab Name: Katahdin Analytical Services

Client Field ID: 25GLM0701

Matrix: WATER

SDG Name:

WP3906

Percent Solids: 0.00

Lab Sample ID: WP3906-046

Concentration Units (ug/L or mg/Kg dry weight): ug/L

Analyte	Control Limits	Spike Result C	Spike Dup. Result C	RPD (Q M	
LEAD		538.0900	504.6900	6.4	P	



Method Blank and Laboratory Control Sample Results

Client: Tetra Tech NUS
Work Order: WP3906

METHOD BLANK RESULTS

LABORATORY CONTROL SAMPLE RESULTS

				_				-1		Elboidi, oid Collino Edillini Eb albo Elb					
	Date	Date		Concentration				Practical		True	Measured	Percent	Acceptance	Acceptance	
	of	of	Units	I	Measured A		Acceptance	ce Quantitation		Value	Value	Recovered	Range	Range	
Parameter	Prep	Analysis			in Blank		Range	Level**					(%)	(mg/kg)	
Nitrate-Nitrogen	14-Sep-99	14-Sep-99	mg/L	<	0.050	<	0.050	0.050	mg/L	1.00	0.931	93.1	80-120		
Sulfate	24-Sep-99	24-Sep-99	mg/L	<	1.0	<	1.0	1.0	mg/L	10	10	100.0	80-120		
	04-Oct-99	04-Oct-99	mg/L	<	1.0	<	1.0	1.0	mg/L,	250	223	89.2	83-112	@	

^{**} Practical quantitation level is the lowest concentration measurable for samples with normal chemical and physical composition during routine laboratory operations.

DATA QUALITY COMMENTS:

Results of all quality control measurements are within the laboratory and method specified acceptance range except as noted.

@ The laboratory uses the internally established statistical 99% confidence range as the acceptance range for this LCS.



Duplicate and Matrix Spike/Matrix Spike Duplicate Results

Client: Tetra	Tech NUS	
Work Order:	WP3906	

DUPLICATE RESULTS

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

_			Samp	ole			Acceptance		Concentration or Quantity					Matrix Spike Recovery (%)				
	Katahdin		Measur	ements	Mean		Range	Units S	Sampl	Spike	Sample	Sample	Sample	Sampl	Acceptance	RPD	Acceptance	
Parameter	Sample No	Units	Rep I	Rep 2	Conc	RPD	for RPD		Only	Added	+Spike	+Spike	+Spike	+Spik	Range	(%)	Range	
						(%)	(%)				Dup 1	Dup 2	Dup 1	Dup	(%)		(%)	
Nitrate - N	WP3906-46	mg/L	0.161	0.163	0.162	1.2	0-20	mg/L	0.16	0.5	0.396		47.2	*	75-125		0-20	

RPD = Relative percent difference, which is the absolute value of the difference between two replicate results divided by the mean concentration then multiplied by 100%.

DATA QUALITY COMMENTS:

Results of all quality control measurements are within the laboratory or contract specified acceptance range except as noted. The laboratory does not use the sample duplicate and matrix spike acceptance ranges as acceptance criteria for a specific analysis. Sample duplicate and matrix spike data are used to evaluate method performance in the environmental sample matrix only. Please refer to LCS data for assessment of quality control for each parameter.

* Matrix spike recovery is outside the laboratory's specified acceptance range indicating potential sample matrix interference and potential bias of reported value for this parameter.

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;091699

Lab Name: Katahdin Analytical Services

SDG No.: WP3906

Lab File ID:

X2884

Lab Sample ID: SBLK;091699

Instrument ID:

5970-X

Date Extracted: 9/16/99

GC Column: RTX-5

ID: 0.25

(mm)

Date Analyzed: 09/23/99

Matrix: (soil/water) WATER

Time Analyzed: 12:48

Level: (low/med)

LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	<u>Lab</u> Sample ID	Lab Data File	Date Injected	Time Injected
LCSD;091699	LCSD;091699	X2886	9/23/99	2:18:00 PM
36GLM0701	WP3906-3	X2887	9/23/99	3:03:00 PM
36GLM0501	WP3906-5	X2889	9/23/99	4:32:00 PM
42GLM0401	WP3906-6	X2890	9/23/99	5:16:00 PM
42GLM0301	WP3906-7	X2891	9/23/99	6:01:00 PM
42GLM0201	WP3906-8	X2892	9/23/99	6:45:00 PM
42GLM0501	WP3906-9	X2893	9/23/99	7:30:00 PM
42GLM1401	WP3906-10	X2894	9/23/99	8:15:00 PM
LCS;091699	LCS;091699	X2899	9/24/99	1:41:00 PM
42GLM1701	WP3906-11	X2901	9/24/99	3:10:00 PM
42GLM1501	WP3906-12	X2902	9/24/99	3:54:00 PM
22GLM0201	WP3906-16	X2904	9/24/99	5:23:00 PM
22GLM0501	WP3906-17	X2905	9/24/99	6:07:00 PM
22GLM0701	WP3906-18	X2906	9/24/99	6:52:00 PM
23GLM0401	WP3906-36	X2907	9/24/99	7:37:00 PM
23GLX0301	WP3906-37	X2908	9/24/99	8:21:00 PM
23GLX0401	WP3906-38	X2909	9/24/99	9:05:00 PM
23GLX0401D	WP3906-39	X2910	9/24/99	9:50:00 PM
23GLM0101	WP3906-41	X2912	9/24/99	11:18:00 PM
36GLM0401	WP3906-4	X2916	9/27/99	12:48:00 PM
22GLM0101	WP3906-15	X2917	9/27/99	1:32:00 PM
23GLM05D01	WP3906-40	X2918	9/27/99	2:17:00 PM



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

∩lient;

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

SBLK;091699

SDG:

WP3906 10/6/99

Report Date: PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/23/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;091699	AQ	•	·	9/16/99	LAP	EPA 3510	KRT
Compound	Re	esult Units	DF	Sample PQL	Method PQL		
NAPHTHALENE		:10 ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<	:10 ug/L	1.0	10	10		
ACENAPHTHYLENE	<	:10 ug/L	1.0	10	10		
ACENAPHTHENE	<	:10 ug/L	1.0	10	10		
FLUORENE	<	:10 ug/L	1.0	10	10		
PHENANTHRENE	<	:10 ug/L	1.0	10	10		
ANTHRACENE	<	:10 ug/L	1.0	10	10		
FLUORANTHENE	<	:10 ug/L	1.0	10	10		
PYRENE	<	:10 ug/L	1.0	10	10		
ENZO[A]ANTHRACENE	<	:10 ug/L	1.0	10	10		
CHRYSENE	<	:10 ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<	:10 ug/L	1.0	10	10		
BENZO[K]FLUORANTHENE	<	:10 ug/L	1.0	10	10		
BENZO[A]PYRENE	<	:10 ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<	:10 ug/L	1.0	10	10		
DIBENZ[A,H]ANTHRACENE	<	:10 ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<	:10 ug/L	1.0	10	10		
NITROBENZENE-D5	1	06 %	1.0				
2-FLUOROBIPHENYL	9	98 %	1.0				
TERPHENYL-D14	1	14 %	1,0				

Report Notes:

Katahdin Analytical Services LCS/LCSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
LCSD;091699	X2886	9/23/99	14:18	KRT	AQ	8270
LCS;091699	X2899	9/24/99	13:41	sw	AQ	8270

	Spk Amt	LCS Result	LCSD Resu	ılt LCS Rec	LCSD Rec	Rec. Limits	RPD	RPD Limit
Compound Name	ug/L	ug/L	ug/L	(%)	(%)	(%)	(%)	(%)
2-METHYLNAPHTHALENE	50	33.9	33.3	*68	*67	70-130	1.5	30
ACENAPHTHENE	50	37.7	35.6	75	71	70-130	5.5	30
ACENAPHTHYLENE	50	37.8	35.8	76	72	70-130	5.4	30
ANTHRACENE	50	42.5	43.9	85	88	70-130	3.5	30
BENZO[A]ANTHRACENE	50	40.6	44.8	81	90	70-130	10	30
BENZO[A]PYRENE	50	38.5	42.3	77	85	70-130	9.9	30
BENZO[B]FLUORANTHENE	50	35.6	45.7	71	91	70-130	25	30
BENZO[G,H,I]PERYLENE	50	44.1	37.9	88	76	70-130	15	30
BENZO[K]FLUORANTHENE	50	38.5	48.1	77	96	70-130	22	30
CHRYSENE	50	50.0	50.4	100	100	70-130	0	30
DIBENZ[A,H]ANTHRACENE	50	42.3	37.6	85	75	70-130	12	30
FLUORANTHENE	50	45.3	47.5	91	95	70-130	4.3	30
FLUORENE	50	36.9	38.2	74	76	70-130	2.7	30
INDENO[1,2,3-CD]PYRENE	50	53.1	33.0	110	*66	70-130	*50	30
NAPHTHALENE	50	32.1	30.5	* 64	*61	70-130	4.8	30
PHENANTHRENE	50	44.9	44.6	90	89	70-130	1.1	30
PYRENE	50	41.1	41.2	82	82	70-130	0	30

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;091799

Lab Name:

Katahdin Analytical Services

SDG No.: WP3906

Lab File ID:

X2921

Lab Sample ID: SBLK;091799

Instrument ID:

5970-X

Date Extracted: 9/17/99

GC Column:

RTX-5

ID: 0.25 (mm) Date Analyzed: 09/27/99

Matrix: (soil/water) WATER

Time Analyzed: 16:30

Level: (low/med)

LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	Lab Data File	Date injected	Time injected
LCS;091799	LCS;091799	X2922	9/27/99	5:14:00 PM
42GLM1601	WP3906-13	X2923	9/27/99	5:59:00 PM
42GLM1001	WP3906-19	X2924	9/27/99	6:43:00 PM
42GLM1001MS	WP3906-19MS	X2925	9/27/99	7:27:00 PM
42GLM1001MSD	WP3906-19MSD	X2926	9/27/99	8:11:00 PM
42GLM0801	WP3906-21	X2928	9/27/99	9:39:00 PM
42GLM1001	WP3906-19DL	X2933	9/28/99	11:59:00 AM
42GLM1201	WP3906-20	X2934	9/28/99	12:43:00 PM
42GLM0601	WP3906-22	X2935	9/28/99	1:27:00 PM
42GLM0701D	WP3906-23	X2936	9/28/99	2:12:00 PM
42GLM0101D	WP3906-24	X2937	9/28/99	2:56:00 PM
42GLM1801	WP3906-25	X2938	9/28/99	3:40:00 PM
36GLM0601	WP3906-28	X2939	9/28/99	4:24:00 PM
36GLM0201	WP3906-29	X2940	9/28/99	5:09:00 PM
36GLM0301	WP3906-30	X2941	9/28/99	5:53:00 PM
42GLM0901	WP3906-32	X2943	9/28/99	7:22:00 PM
42GLM0101	WP3906-34	X2945	9/28/99	8:50:00 PM
42GLM0601	WP3906-22RA	X2947	9/29/99	10:07:00 AM
42GLM0701	WP3906-31	X2948	9/29/99	10:51:00 AM
42GLM1101	WP3906-33	X2949	9/29/99	11:35:00 AM
42GLM1301	WP3906-35	X2950	9/29/99	12:20:00 PM
25GLM0301	WP3906-42	X2951	9/29/99	1:04:00 PM
25GLM0801	WP3906-43	X2952	9/29/99	1:48:00 PM
25GLM0601	WP3906-44	X2953	9/29/99	2:32:00 PM
16GLM7D01	WP3906-47	X2954	9/29/99	3:17:00 PM



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

SBLK;091799

SDG:

WP3906 10/6/99

Report Date: PO No. :

N7912-P99264

Project:

CTO #68

% Sollds:

N/A

EPA 8270

Method: Date Analyzed: 9/27/99

Sample Description	Matrix Sa	mpled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;091799	AQ	•	•	9/17/99	DPD	EPA 3510	SW
Compound	Result	Ünits	DF	Sample PQL	Method PQL		
NAPHTHALENE	<10	ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10		
ACENAPHTHYLENE	<10	ug/L	1.0	10	10		
ACENAPHTHENE	<10	ug/L	1.0	10	10		
FLUORENE	<10	ug/L	1.0	10	10		
PHENANTHRENE	<10	ug/L	1.0	10	10		
ANTHRACENE	<10	ug/L	1.0	10	10		
FLUORANTHENE	<1ū	ug/L	1.0	10	10		
PYRENE	<10	ug/L	1.0	10	10		
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10		
CHRYSENE	<10	ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZOKIFLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO[A]PYRENE	<10	ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<10	ug/L	1.0	10	10		
DIBENZ[A,H]ANTHRACENE	<10	ug/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10		
NITROBENZENE-D5	82	%	1.0				
2-FLUOROBIPHENYL	81	%	1.0				
TERPHENYL-D14	112	%	1.0				

Report Notes:

Katahdin Analytical Services 8270 LCS Recovery Sheet

Lab File: X2922

Sample ID: LCS;091799

Date Run: 9/27/99

Analyst: SW

Time Injected: 5:14:00 PM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	. 33.1	*66	70-130
ACENAPHTHENE	50	34.4	*69	70-130
ACENAPHTHYLENE	50	34.5	•69	70-130
ANTHRACENE	50	45.7	91	70-130
BENZO[A]ANTHRACENE	50	44.5	89	70-130
BENZO[A]PYRENE	50	44.6	89	70-130
BENZO[B]FLUORANTHENE	50	44.5	89	70-130
BENZO[G,H,I]PERYLENE	50	46.5	93	70-130
BENZO[K]FLUORANTHENE	50	46.5	93	70-130
CHRYSENE	50	53.3	106	70-130
DIBENZ[A,H]ANTHRACENE	50	44 .I	88	70-130
FLUORANTHENE	50	43.5	87	70-130
FLUORENE	50	35.5	71	70-130
INDENO[1,2,3-CD]PYRENE	50	41.0	82	70-130
NAPHTHALENE	50	31.3	*62	70-130
PHENANTHRENE	50	47.5	95	70-130
PYRENE	50	48.8	98	70-130

Katahdin Analytical Services MS/MSD Report

Sample	File Name	Date Acquired	Time inj	Analyst	Matrix	Method
WP3906-19	X2924	9/27/99	6:43:00 PM	sw	AQ	8270_99
WP3906-19MS	X2925	9/27/99	7:27:00 PM	SW	AQ	8270 <u>9</u> 9
WP3906-19MSD	X2926	9/27/99	8:11:00 PM	SW	AQ	8270_99

Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
CHRYSENE	0	56	54	45.8	44.6	82	82	60-140	2.6	30
ACENAPHTHENE	57.8	56	54	104	97.8	82	74	60-140	6.1	30
ACENAPHTHYLENE	0	56	54	35.9	37.2	64	69	60-140	3.6	30
ANTHRACENE	9.96	56	54	50.1	45.9	72	66	60-140	8.8	30
BENZO[A]ANTHRACENE	0	56	54	37.2	39.2	66	72	60-140	5.2	30
BENZO[A]PYRENE	0	56	54	35.2	41.3	63	76	60-140	16	30
BENZO[B]FLUORANTHENE	0	56	54	34.5	43.5	62	80	60-140	23	30
2-METHYLNAPHTHALENE	34.7	56	54	74.6	52.1	71	*32	60-140	*36	30
BENZO[K]FLUORANTHENE	0	56	54	34.0	42.4	61	78	60-140	22	30
PYRENE	13.2	56	54	57.6	58.9	79	85	60-140	2.2	30
DIBENZ[A,H]ANTHRACENE	0	56	54	35.2	37.8	63	70	60-140	7.1	30
FLUORANTHENE	20.8	56	54	59.1	61.9	68	76	60-140	4.6	30
FLUORENE	32.4	56	54	72.3	60.0	71	*51	60-140	18	30
INDENO[1,2,3-CD]PYRENE	0	56	54	38.2	32.0	68	*59	60-140	18	30
NAPHTHALENE	255	56	54	365	356	*197	+187	60-140	2.5	30
PHENANTHRENE	66.0	56	54	116	98.8	89	61	60-140	16	30
BENZO[G,H,I]PERYLENE	0	56	54	39.3	40.8	70	76	60-140	3.7	30

4B SEMIVOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

SBLK;092099

Lab Name:

Katahdin Analytical Services

SDG No.: WP3906

Lab File ID:

X2931

Lab Sample ID: SBLK;092099

Instrument ID:

5970-X

Date Extracted: 9/20/99

GC Column:

RTX-5

ID: 0.25 (mm) Date Analyzed: 09/28/99

Matrix: (soil/water) WATER

Time Analyzed: 10:30

Level: (low/med)

LOW

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCS;092099	LCS;092099	X2932	9/28/99	11:14:00 AM
36GLM0201D	WP3906-14	X2955	9/29/99	4:01:00 PM
25GLM0401	WP3906-45	X2956	9/29/99	4:45:00 PM
26GLP1201	WP3906-48	X2958	9/29/99	6:13:00 PM
26GLP1301	WP3906-49	X2959	9/29/99	6:58:00 PM
25GLM0701	WP3906-46	X2962	9/30/99	8:46:00 AM



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client: Paul Calligan

> Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

Report Date:

SBLK;092099

SDG:

WP3906

PO No.:

10/6/99

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method:

EPA 8270

Date Analyzed: 9/28/99

Sample Description	Matrix S	ampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
SBLK;092099	AQ	-	<u>-</u>	9/20/99	D S	EPA 3510	KRT
Compound	Resul	t Units	DF	Sample PQL	Method PQL	,	
NAPHTHALENE	<10	ug/L	1.0	10	10		
2-METHYLNAPHTHALENE	<10	ug/L	1.0	10	10		
ACENAPHTHYLENE	<10	ug/L	1.0	10	10		
ACENAPHTHENE	<10	ug/L	1.0	10	10		
FLUORENE	<10	ug/L	1.0	10	10		
PHENANTHRENE	<10	ug/L	1,0	10	10		
ANTHRACENE	<10	ug/L	1.0	10	10		
FLUORANTHENE	<10	ug/L	1.0	10	10		
PYRENE	<10	ug/L	1.0	10	10		
BENZO[A]ANTHRACENE	<10	ug/L	1.0	10	10		
CHRYSENE	<10	ug/L	1.0	10	10		
BENZO[B]FLUORANTHENE	<10	ug/L	1.0	10	10		
BENZO(K)FLUORANTHENE	<10	υg/L	1.0	10	10		
BENZO[A]PYRENE	<10	ug/L	1.0	10	10		
INDENO[1,2,3-CD]PYRENE	<10	υg/L	1.0	10	10		
DIBENZ(A,H)ANTHRACENE	<10	υg/L	1.0	10	10		
BENZO[G,H,I]PERYLENE	<10	ug/L	1.0	10	10		
NITROBENZENE-D5	84	%	1.0				
2-FLUOROBIPHENYL	93	%	1.0				
TERPHENYL-D14	90	%	1.0				

Report Notes:

Katahdin Analytical Services 8270 LCS Recovery Sheet

Lab File: X2932

Sample ID: LCS;092099

Date Run: 9/28/99

Analyst: SW

Time Injected: 11:14:00 AM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
2-METHYLNAPHTHALENE	50	37.9	76	70-130
ACENAPHTHENE	50	38.6	77	70-130
ACENAPHTHYLENE	50	40.3	80	70-130
ANTHRACENE	50	42.9	86	70-130
BENZO[A]ANTHRACENE	50	41.3	82	70-130
BENZO[A]PYRENE	50	41.0	82	70-130
BENZO[B]FLUORANTHENE	50	40.5	81	70-130
BENZO[G,H,I]PERYLENE	50	43.8	88	70-130
BENZO(K)FLUORANTHENE	50	42.3	84	70-130
CHRYSENE	50	50.7	101	70-130
DIBENZ[A,H]ANTHRACENE	50	39.2	78	70-130
FLUORANTHENE	50	42.4	85	70-130
FLUORENE	50	37.0	74	70-130
INDENO[1,2,3-CD]PYRENE	50	40.7	81	70-130
NAPHTHALENE	50	37.1	74	70-130
PHENANTHRENE	50	44.5	89	70-130
PYRENE	50	46.0	92	70-130

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ15B

Lab File ID:

Lab Name: Katahdin Analytical Services

SDG No.: WP3906

Lab Sample ID: VBLKQ15B

Date Analyzed: 09/15/99

Time Analyzed: 17:14

Q6633

GC Column: RTX-502 ID: 0.53 (mm)

Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ15B	LCSQ15B	Q6632	9/15/99	4:29:00 PM
36GLM0701	WP3906-3	Q6634	9/15/99	6:11:00 PM
36GLM0401	WP3906-4	Q6635	9/15/99	6:49:00 PM
36GLM0501	WP3906-5	Q6636	9/15/99	7:27:00 PM
42GLM0401	WP3906-6	Q6637	9/15/99	8:05:00 PM
WP3906-19MS	WP3906-19MS	Q6638	9/15/99	8:42:00 PM
WP3906-19MSDD	WP3906-19MSD	Q6639	9/15/99	9:21:00 PM
42GLM0301	WP3906-7	Q6640	9/15/99	9:58:00 PM
42GLM0201	WP3906-8	Q6641	9/15/99	10:37:00 PM
42GLM1401	WP3906-10	Q6643	9/15/99	11:52:00 PM
42GLM1701	WP3906-11	Q6644	9/16/99	12:31:00 AM
42GLM1501	WP3906-12	Q6645	9/16/99	1:09:00 AM
42GLM1601	WP3906-13	Q6646	9/16/99	1:47:00 AM
36GLM0201D	WP3906-14	Q6647	9/16/99	2:25:00 AM



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Paul Calligan Client:

> Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKQ15B

SDG:

WP3906

Report Date:

10/12/99

PO No.:

N7912-P99264

Project:

CTO #68

% Solids:

N/A

Method: Date Analyzed: 9/15/99

SW8260

Sample Description	Matrix S	ampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKQ15B Compound	AQ	-	•	9/15/99	HMP Method PQL	5030	НМР
	Resui	Result Units DF	DF	Sample PQL			
BENZENE	<5	ug/L	1.0	5	5		
TOLUENE	<5	ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5		
ETHYLBENZENE	<5	ug/L	1.0	5	5		
NAPHTHALENE	J2	ug/L	1.0	5	5		
MTBE	<5	ug/L	1.0	5	5		
TOTAL XYLENES	<5	ug/L	1.0	5	. 5		
DIBROMOFLUOROMETHANE	92	%	1.0				
1,2-DICHLOROETHANE-D4	82	%	1.0				
OLUENE-D8	98	%	1.0				
P-BROMOFLUOROBENZENE	98	%	1.0				

Report Notes:

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: Q6632

Sample ID: LCSQ15B

Date Run: 9/15/99

Analyst: JSS

Time Injected: 4:29:00 PM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	52.1	104	60-140
BENZENE	50	49.5	99	60-140
ETHYLBENZENE	50	55.3	110	60-140
мтве	50	50.6	101	60-140
NAPHTHALENE	50	52.4	105	60-140
TOLUENE	50	50.8	102	60-140
TOTAL XYLENES	150	151	101	60-140

Katahdin Analytical Services

MS/MSD Report

Sample	File Name	Date Acqu	ired T	ìme i Dj	Analyst	Matrix	Method			
WP3906-19	Q6653	9/16/9	9 11:	17:00 AM	JSS	AQ	8260_99			
WP3906-19MS	Q6638	9/15/9	9 8:4	2:00 PM	HMP	AQ	8260_99			
WP3906-19MSD	Q6639	9/15/9	9 9:2	1:00 PM	НМР	AQ	8260_99			
Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
NAPHTHALENE	832	50	50	548	553	*570	+560	60-140	0.91	20
1,2-DIBROMOETHANE	0	50	50	67.7	63.2	135	126	60-140	6.9	20
BENZENE	0	50	50	59.8	51.4	120	103	60-140	15	20
МТВЕ	0	50	50	72.9	63.8	*146	128	60-140	13	20
TOLUENE	0	50	50	63,2	53.5	126	107	60-140	17	20
TOTAL XYLENES	3.01	150	150	186	159	122	104	60-140	16	20
ETHYLBENZENE	0	50	50	69.8	58.6	140	117	60-140	17	20

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKQ17A

Lab Name:

Katahdin Analytical Services

SDG No.: WP3906

Lab Sample ID: VBLKQ17A

Lab File ID:

Q6669

Date Analyzed: 09/17/99

Time Analyzed: 9:44

GC Column: RTX-502 ID: 0.53

(mm)

Heated Purge: (Y/N) N

Instrument ID: 5970-Q

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSQ17A	LCSQ17A	Q6668	9/17/99	8:50:00 AM
22GLM0701	WP3906-18	Q6670	9/17/99	10:41:00 AM
42GLM1201	WP3906-20	Q6671	9/17/99	11:19:00 AM
42GLM0801	WP3906-21	Q6672	9/17/99	11:57:00 AM
22GLM0501MS	WP3906-17MS	Q6673	9/17/99	12:35:00 PM
22GLM0501MSD	WP3906-17MSD	Q6674	9/17/99	1:14:00 PM
42GLM0601	WP3906-22	Q6676	9/17/99	2:30:00 PM
42GLM0701D	WP3906-23	Q6677	9/17/99	3:07:00 PM
42TL00101	WP3906-26	Q6680	9/17/99	5:03:00 PM
36GLM0601	WP3906-28	Q6681	9/17/99	5:40:00 PM
36GLM0201	WP3906-29	Q6682	9/17/99	6:18:00 PM



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

NAPHTHALENE

TOTAL XYLENES

TOLUENE-D8

DIBROMOFLUOROMETHANE

P-BROMOFLUOROBENZENE

1,2-DICHLOROETHANE-D4

MTBE

Lab Number:

VBLKQ17A

SDG:

WP3906 10/12/99

Report Date: PO No. :

N7912-P99264

Project:

CTO #68

% Solids:

5

5

5

5

5

5

NA

Method: Date Analyzed: 9/17/99

SW8260

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst	
VBLKQ17A	AQ	-	•	9/17/99	KMC	5030	KMC	
Compound	Res	ult Units	DF	Sample PQL	Method PQL	, , ,		
BENZENE	<5	5 ug/L	1.0	5	5		_	
TOLUÉNE	<5	5 ug/L	1.0	5	5			
1,2-DIBROMOETHANE	<5	5 ug/L	1.0	5	5			
ETHYLBENZENE	<5	5 ug/L	1.0	5	5			

1.0

1.0

1.0

1.0

1.0

1.0

1.0

<5

<5

<5

89

81

98

98

ug/L

ug/L

ug/L

%

%

%

Report Notes:

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: Q6668

Sample ID: LCSQ17A

Date Run: 9/17/99

Analyst: KMC

Time Injected: 8:50:00 AM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	46.7	93	60-140
BENZENE	50	45.9	92	60-140
ETHYLBENZENE	50	50.8	102	60-140
МТВЕ	50	49.1	98	60-140
NAPHTHALENE	50	50.6	101	60-140
TOLUENE	50	50.0	100	60-140
TOTAL XYLENES	150	137	91	60-140

Katahdin Analytical Services

MS/MSD Report

nple	File Name	Date Acqu	ired	Time inj	Analysi	Matrix	Method			
WP3906-17	Q6658	9/16/9	9 2:	59:00 PM	JSS	AQ	8260_99			
WP3906-17MS	Q6673	9/17/9	9 12	:35:00 PM	KMC	AQ	8260_99			
WP3906-17MSD	Q6674	9/17/9	9 1:	14:00 PM	KMC	AQ	8260_99			
Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)		MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	150	150	126	127	84	85	60-140	0.79	20
TOLUENE	0	50	50	46.7	44.6	93	89	60-140	4.6	20
NAPHTHALENE	0	50	50	62.1	62.4	124	125	60-140	0.48	20
мтве	0	50	50	53.8	55.0	108	110	60-140	2.2	20
ETHYLBENZENE	0	50	50	46.8	47.6	94	95	60-140	1.7	20
BENZENE	0	50	50	44.8	43.2	90	86	60-140	3.6	20
1,2-DIBROMOETHANE	0	50	50	51.4	47.5	103	95	60-140	7.9	20

VOLATILE ORGANICS METHOD BLANK SUMMARY

EPA SAMPLE NO.

VBLKU22A

Lab Name: Katahdin Analytical Services

SDG No.: WP3906

Lab File ID:

U1018

Lab Sample ID: VBLKU22A

Date Analyzed: 09/22/99

Time Analyzed: 10:44

GC Column: RTX-624 ID: 0.18

(mm)

Heated Purge: (Y/N) N

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU22A	LCSU22A	U1017	9/22/99	9:54:00 AM
25GLM0601	WP3906-44DL	U1019	9/22/99	11:32:00 AM
23GLM0401	WP3906-36DL	U1021	9/22/99	12:47:00 PM
36GLM0501MS	WP3906-5MS	U1025	9/22/99	3:14:00 PM
36GLM0501MSD	WP3906-5MSD	U1026	9/22/99	3:50:00 PM



KATAHDIN ANALYTICAL SERVICES REPORT OF ANALYTICAL RESULTS

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKU22A

SDG:

WP3906

Report Date:

10/12/99

PO No. : Project: N7912-P99264 CTO #68

Toject.

...

% Solids:

N/A

Method:

SW8260

Date Analyzed: 9/22/99

Sample Description	Matrix	Sampled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU22A	AQ	-	<u>.</u>	9/22/99	KMC	5030	KMC
Compound	Res	sult Units	DF	Sample PQL	Method PQL		
BENZENE	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
TOLUENE	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
1,2-DIBROMOETHANE	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
ETHYLBENZENE	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
NAPHTHALENE	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
МТВЕ	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
TOTAL XYLENES	</td <td>5 ug/L</td> <td>1.0</td> <td>5</td> <td>5</td> <td></td> <td></td>	5 ug/L	1.0	5	5		
DIBROMOFLUOROMETHANE	11	0 %	1.0				
1,2-DICHLOROETHANE-D4	99	9 %	1.0				
TOLUENE-D8	10	7 %	1.0				
'-BROMOFLUOROBENZENE	10	4 %	1.0				

eport Notes:

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: U1017

Sample ID: LCSU22A

Date Run: 9/22/99

Analyst: KMC

Time Injected: 9:54:00 AM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	49.7	99	60-140
BENZENE	50	51.1	102	60-140
ETHYLBEN2ENE	50	48.6	97	60-140
МТВЕ	50	41.8	84	60-140
NAPHTHALENE	50	41.2	82	60-140
TOLUENE	50	53.6	107	60-140
TOTAL XYLENES	150	141	94	60-140

Katahdin Analytical Services

MS/MSD Report

ample	File Name	Date Acqu	ilred T	ime inj	Analyst	Matrix	Method			
WP3906-5	Q6636	9/15/9	9 7:2	7:00 PM	НМР	AQ	8260_99			
WP3906-5MS	U1025	9/22/9	9 3:1	4:00 PM	KMC	AQ	8260_99			
WP3906-5MSD	U1026	9/22/9	9 3:5	0:00 PM	КМС	AQ	8260_99			
Compound Name	Native (ug/L)	MS Spk Amount (ug/L)	MSD Spk Amount (ug/L)	MS Result (ug/L)	MSD Result (ug/L)	MS REC (%)	MSD REC (%)	Recovery Limits (%)	RPD (%)	RPD Limit (%)
TOTAL XYLENES	0	150	150	134	123	89	82	60-140	8.6	20
TOLUENE	0	50	50	51.1	46.5	102	93	60-140	9.4	20
NAPHTHALENE	0	50	50	45.6	42.6	91	85	60-140	6.8	20
мтве	0	50	50	45.4	43.4	91	87	60-140	4.5	20
ETHYLBENZENE	0	50	50	45.6	41.8	91	84	60-140	8.7	20
BENZENE	0	50	50	48.5	44.6	97	89	60-140	8.4	20
1,2-DIBROMOETHANE	0	50	50	53.6	48.8	107	98	60-140	9.4	20

VOLATILE ORGANICS METHOD BLANK SUMMARY

(mm)

EPA SAMPLE NO.

VBLKU30A

Lab Name: Katahdin Analytical Services

SDG No.: WP3906

Lab File ID:

U1144

Lab Sample ID: VBLKU30A

Date Analyzed: 09/30/99

Time Analyzed: 10:19

GC Column: RTX-624 ID: 0.18

Heated Purge: (Y/N) N

Instrument ID: 5973-U

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, LCS'S, MS AND MSD'S:

Client Sample ID	Lab Sample ID	Lab Data File	Date Injected	Time Injected
LCSU30A	LCSU30A	U1143	9/30/99	9:27:00 AM
36GLM0301	WP3906-30	U1147	9/30/99	12:19:00 PM



KATAHDIN ANALYTICAL SERVICES **REPORT OF ANALYTICAL RESULTS**

Client:

Paul Calligan

Tetra Tech NUS 1401 Oven Park Dr.

Suite 102

Tallahassee, FL 32308

Proj. ID: CNC CHARLESTON

Lab Number:

VBLKU30A

SDG:

WP3906

Report Date:

10/12/99

PO No.:

N7912-P99264

Project:

CTO #68 N/A

% Solids:

Method:

SW8260

Date Analyzed: 9/30/99

Sample Description	Matrix Sa	impled Date	Rec'd Date	Ext. Date	Ext'd By	Ext. Method	Analyst
VBLKU30A	AQ	-	-	9/30/99	JSS	5030	JSS
Compound	Result	Units	DF	Sample PQL	Method PQL		
BENZENE	<5	ug/L	1.0	5	5		
TOLUENE	<5	ug/L	1.0	5	5		
1,2-DIBROMOETHANE	<5	ug/L	1.0	5	5		
ETHYLBENZENE	<5	ug/L	1.0	5	5		
NAPHTHALENE	<5	ug/L	1.0	5	5		
MTBE	<5	ug/L	1.0	5	5		
TOTAL XYLENES	<5	ug/L	1.0	5	. 5		
DIBROMOFLUOROMETHANE	102	%	1.0				
1,2-DICHLOROETHANE-D4	103	%	1.0				
OLUENE-D8	99	%	1.0				
~-BROMOFLUOROBENZENE	98	%	1.0				

eport Notes:

Katahdin Analytical Services 8260 LCS Recovery Sheet

Lab File: U1143

Sample ID: LCSU30A

Date Run: 9/30/99

Analyst: JSS

Time Injected: 9:27:00 AM

Matrix: AQ

Compound Name	Spike Amt (ug/L)	Result (ug/L)	Rec (%)	Limits (%)
1,2-DIBROMOETHANE	50	53.2	106	60-140
BENZENE	50	52.0	104	60-140
ETHYLBENZENE	50	52.2	104	60-140
МТВЕ	50	48.2	96	60-140
NAPHTHALENE	50	50.4	101	60-140
TOLUENE	50	53.9	108	60-140
TOTAL XYLENES	150	155	103	60-140





ENSR Air Toxics Specialty Laboratory 42 Nagog Park Acton, MA 01720

DATE:

October 12, 1999

TO:

Andrea Colby

Katahdin Analytical 340 County Road No. 5

P.O. Box 720

Westbrook, ME 04098

Re:

Organic Analyses of Aqueous Samples for Methane by Gas

Chromatography/ Flame Ionization Detection (GC/FID)- WP3906

PROJECT #: 8601-008-200

LAB ID #:

990175

ANALYTICAL PROCEDURE:

Nine (9) aqueous samples were analyzed for methane under the guidelines of SW-846 Method 3810.

A Hewlett Packard 5890 series II gas chromatograph (GC) equipped with a Hewlett Packard flame ionization detector (FID) was used for the analysis. A 1.0 mL headspace aliquot of each sample was injected into the column for analysis. The operating conditions of the GC/FID are listed in Table 1. A five point calibration was performed for the target analyte, methane.

No problems occurred during sample receipt, log-in, or analysis.





QUALITY CONTROL:

- 1. A laboratory blank was analyzed daily in the same manner as the samples. Methane was not detected in the blank.
- MS/MSD analyses were performed on the following sample: WP3906-28

The recoveries and relative percent differences of methane were within the QC acceptance limits.

- 3. A duplicate analysis was performed on the following sample: WP3906-34(A)
- 4. A laboratory control spike was analyzed daily. The recovery of methane was within the QC acceptance limits.

Date Samples Received by the Laboratory: 9/16/99

Date Analysis Started: 9/24/99

C:\My Documents\Kat 990175 990178 990180\katrpt3.doc

Katahdin Katahdin TEAL SERVICES 340 County Road No. 5 P.O. Box 720 Westbrook, ME 04098 Tel: (207) 874-2400

CHAIN of CUSTODY

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	INP 3906-19	9-13-99/1015	AQ	3	×			7	74 ₅	i				
	LIP 3906 29	/1055	1	3	X	<u> </u>				5				
	1.75 mg 20	/1131		3	X		ļ	_		 د				
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F	Relinquished By: (Signature)	Date / Time Rece	ived By: (S	ignature	e)	Relinquis	hed By: (Signature) Da	ate / Ti	me F	Received	By: (Sign	ature)

SAMPLE LOG-IN & RECEIPT CHECKLIST

oj Mgr. M. Hzyt	1 11 2 00		Lab Pool #:	
spected & Logged in by:_	A. MacDutt		Date Time: 9	16/99@14
Sample Matrix_	Number of Samples	Analysis Requested	Analyze by (date)	Storage Location
Aqueous	9 (9/30/99	RI
		,	Due 10/13	
	:	,		;
	,		:	:
COC present/ not pres				
COC Tape present no Samples broken / Intact Samples ambient / chille	t present on shipping on receipt on receipt	dank=5°(
COC Tape present no Samples broken / Intact Samples ambient / chille Samples preserved com	t present on shipping on receipt on receipt on receipt ectly / incorrectly / non	dank=5°(
COC Tape present no Samples broken / intact	t present on shipping on receipt on receipt on receipt ectly / incorrectly / non	dank=5°(
COC Tape present no Samples broken / Intact Samples ambient / chille Samples preserved com	on receipt on receipt on receipt on receipt on receipt rectly / incorrectly / non e holding time	dank=5°(
COC Tape present no Samples broken / Intact Samples ambient / Chille Samples preserved com Received within outsid	on receipt on receipt on receipt ectly / incorrectly / none holding time t present on samples	dank=5°(e recommende	ed ·	

Lab Name: ENSR	Contract:	WP3906-28(A)	_
Lab Code:	Case No.:	SAS NO.: SDG NO.:	
Matrix: (soil/water)	_water	Lab Sample ID: 990175-1	
Sample wt / vol: 32.	5 ml (g/ml)	Lab File ID:KAT_022	
Level: (low/med)	_ low	Date Received:9/16/99	
% Moisture: NA		Date Analyzed:9/24/99	
GC Column: _ Carboxen	1004 OD: 1/16"	Dilution Factor:1	-
Soil Extract Volume:	NA (µl)	Soil Aliquot Volume: NA (µl)	
		CONCENTRATION UNITS:	
CAS NO.	COMPOUND	(µg/L or PPMv) µg/L	Q
74-82-8	Methane	190	

		·	
Lab Name:ENSF	R Contract:	WP3906-29(C)
Lab Code:	Case No.;	_ SAS NO.: SDG NO.: _	
Matrix: (soil/water)	water	Lab Sample ID: 990175-2	
Sample wt / vol: 32	2.5 ml (g/ml)	Lab File tD:KAT_020	_
Level: (low/med)	low	Date Received:9/16/99	
% Moisture:NA		Date Analyzed:9/24/99	
GC Column: _ Carboxer	n 1004 OD: 1/16"	Dilution Factor:1	
Soil Extract Volume:	NA (Iµ)	Soil Aliquot Volume: NA	_ (µl)
CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	4600	E

Lab Name: ENSR	Contract:		WP3906-29(C)	D
Lab Code:	Case No.:	_ SAS NO.:	SDG NO.:	
Matrix: (soil/water)	water	Lab Sample ID:	990175-2 DIL	
Sample wt / vol: 32	.5 ml (g/ml)	Lab File ID:	KAT_021	
Level: (low/med)	low	Date Received:	9/16/99	_
% Moisture: NA _		Date Analyzed:	9/24/99	
GC Column: _ Carboxen	1004 OD: 1/16"	Dilution Factor:	144	
Soil Extract Volume:	NA (µl)	Soil Aliquot Volu	лте: NA (µ	ıl)
CAS NO.	COMPOUND	CONCENTRAT (µg/L or PPMv)		Q
74-82-8	Methane	6700		D

Lab Name: ENSR	Contract:	WP3906-30(A)	
Lab Code:	Case No.:	SAS NO.: SDG NO.:	
Matrix: (soil/water)	_water	Lab Sample ID: 990175-3	
Sample wt / vol: 32	.5 ml (g/ml)	Lab File ID:KAT_018	
Level: (low/med)	_ low	Date Received:9/16/99	
% Moisture: NA _		Date Analyzed:9/24/99	
GC Column: _ Carboxen	1004 OD: 1/16"	Dilution Factor:1	
Soil Extract Volume:	NA (μl)	Soil Aliquot Volume: NA (µl)	
CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L Q	
74-82-8	Methane	5400 E	

Lab Name: ENSR	Contract:	WP3906-30(A) D
Lab Code:	Case No.:	SAS NO.: SDG NO.: _	
Matrix: (soil/water)	_water	Lab Sample ID: 990175-3 DIL	
Sample wt / vol: 32.	5 ml (g/ml)	Lab File ID:KAT_019	
Level: (low/med)	_low	Date Received:9/16/99	
% Moisture: NA		Date Analyzed:9/24/99	
GC Column: _ Carboxen	1004 OD: 1/16"	Dilution Factor: 125	
Soil Extract Volume:	NA (µl)	Soil Aliquot Volume: NA	_ (µl)
CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	9100	D

Lab Name: ENSR _	Contract:	VBLK01	
Lab Code:	Case No.:	SAS NO.: SDG NO.:	
Matrix: (soil/water)v	vater	Lab Sample ID: MB990175	
Sample wt / vol: 32.5 i	ml (g/ml)	Lab File ID:KAT_006	
Level: (low/med) I	low	Date Received:NA	
% Moisture: NA		Date Analyzed:9/24/99	_
GC Column: _ Carboxen 10	004 OD: 1/16"	Dilution Factor:11	_
Soil Extract Volume:	ΝΑ (μΙ)	Soil Aliquot Volume: NA (µI)	
CAS NO. C	OMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8 M	lethane	5.2	U

Lab Name: ENSR	Contract:	LCS01	
Lab Code:	Case No.:	SAS NO.: SDG NO.:	
Matrix: (soil/water)	water	Lab Sample ID: LCS990175	
Sample wt / vol: 32.5	i ml (g/ml)	Lab File ID:KAT_007	
Level: (low/med)	_low	Date Received:NA	
% Moisture: NA	<u> </u>	Date Analyzed:9/24/99	
GC Column: _ Carboxen 1	004 OD: 1/16"	Dilution Factor:1	
Soil Extract Volume:	_ NA (µI)	Soil Aliquot Volume: NA	_ (µì)
CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L	Q
74-82-8	Methane	210	

	ORGANICS ANALYSIS	S DATA SHEET
		EPA SAMPLE NO.
Lab Name: ENSR	Contract:	WP3906-28(B) MS
Lab Code:	_ Case No.:	_ SAS NO.: SDG NO.:
Matrix: (soil/water) wa	ater	Lab Sample ID: 990175-1 MS
Sample wt / vol: 32.5 m	ıl (g/ml)	Lab File ID:KAT_023
Level: (low/med) lo	w	Date Received:9/16/99
% Moisture: NA		Date Analyzed:9/24/99
GC Column; _ Carboxen 100	04 OD: 1/16"	Dilution Factor:1
Soil Extract Volume:N	ΙΑ (μΙ)	Soil Aliquot Volume: NA (μΙ)
CAS NO. CO)MPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L Q
74-82-8 Me	thane	340

Lab Name: ENSR	Contract:	WP3906-28(C) MSD
Lab Code:	Case No.:	SAS NO.: SDG NO.:
Matrix: (soil/water)	_ water	Lab Sample ID: 990175-1 MSD
Sample wt / vol: 32	.5 ml (g/ml)	Lab File ID:KAT_024
Level: (low/med)	_ low	Date Received:9/16/99
% Moisture:NA _		Date Analyzed: 9/24/99
GC Column: _ Carboxen	1004 OD: 1/16"	Dilution Factor:1
Soil Extract Volume:	NA (µI)	Soil Aliquot Volume: NA (µl)
CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or PPMv) µg/L Q
74-82-8	Methane	350

3 LABORATORY CONTROL SPIKE RECOVERY

.ab Name:	ENSR	Contract:		
_ab Code:	Case NO.:	SAS NO.:	SDG NO.:	
_aboratory Contro	ol Sample No: LCS0	1	<u> </u>	

COMPOUND	SPIKE	LCS	LCS	QC
	ADDED	CONCENTRATION	%	LIMITS
	(µg/L)	(µg/L)	REC #	REC.
Methane	205.0	206.7	101%	50 - 150

^{* -} Values outside of QC limits.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: _	ENSR		Contract:										
Lab Code:		Case NO	D.: s	SDG NO.:									
Matrix Spike -	EPA Sample	NO.:WP39	06-28	_									
								,					
		SPIKE	SAMPLE		MS		MS	QC					
		ADDED	CONCENTRATION	CONCE	ENT	RATION	%	LIMITS					
COM	IPOUND	(µg/L)	(µg/L)		L)	REC #	REC.						
Me	ethane	205.0	189	344.8			76%	50-150					
		SPIKE	MSD	MSD			_						
		ADDED	CONCENTRATION	%		%	QC	LIMITS					
COM	IPOUND	(µg/L)	(µg/L)	REC	#_	RPD #	RPD	REC.					
Me	ethane	205.0	345.8	77%		0.68%	50	50-150					
Spike rec RPD: Commen		0 out t of 1	of2 outside _ outside limits.	limits.									

APPENDIX E AQUIFER CHARACTERIZATION GRAPHS

Calculation of Hydraulic Gradient (i)

Equation:
$$i = \Delta H_{\Delta X}$$

Where:

i = the hydraulic gradient

 ΔH = the difference in head between the data points

 ΔX = the linear distance between the data points

NOTE: Please refer to Table 1 for groundwater elevations and Figure 5 for the location of data points.

A: Calculation of
$$i_{M-04-M-03}$$

$$\Delta H = 4.02 \, ft - 3.85 \, ft = 0.17 \, ft$$

$$\Delta X = 37 ft$$

$$i = \frac{0.17 \text{ft}}{37 \text{ft}} = 0.004595 \text{ }^{\text{ft}}/_{\text{ft}}$$

B: Calculation of i_{M-06 - M-01}

$$\Delta H = 5.17 \text{ ft} - 3.78 \text{ ft} = 1.39 \text{ ft}$$

$$\Delta X = 145 ft$$

$$i=1.39 \text{ ft}/145 \text{ ft}=0.009586 \text{ }^{\text{ft}}/\text{ft}$$

Calculating the arithmetic mean:

$$i = \frac{0.004595 + 0.009586}{2} = 0.007091 ft/_{ft}$$

Prepared By: _____ Checked By: _____

Date: _____

Calculation of Groundwater Seepage Velocity

Equation:
$$V = \frac{\overline{K}i}{\eta_o}$$

Where:

V = the groundwater seepage velocity

i = the hydraulic gradient

K = the hydraulic conductivity [based on results of slug tests conducted in well NBClGDI014 (Zone I RFI)]

 η_e = the effective porosity

The term effective porosity refers to the percentage of the total porosity through which groundwater flows. Based on laboratory grain-sze analysis, the grain-size distribution of the aquifer media through which groundwater moves is 46.6% sand, 46.3% silt. In order to estimate $\eta_{\rm e}$, the grain-size distribution was plotted on a ternary diagram (taken from *Applied Hydrology*, C.W. Fetter, page 69) that represents the relationship between grain size and specific yield (specific yield refers to the percentage of pore water that will release in response to gravity).

i = 0.007091

$$K = 0.00245$$
 cm/_{sec}

$$\eta_{\circ} = 0.20$$

$$V = \frac{0.00245 \frac{cm}{sec} (0.007091)}{0.20} = \frac{1.7373^{-5} \frac{cm}{sec}}{0.20}$$

 $V = 8.6865 \times 10^{-5} \, \text{cm} / \text{sec}$

$$V = 8.6865 \times 10^{-5} \, \text{cm} / \text{sec} \times 31,536,000 \, \text{sec} / \text{vr} \times 0.033 \, \text{f} / \text{cm} = 90.4 \, \text{ff} / \text{vr}$$

Prepared By:	Checked By:
Date:	Data:

Client:

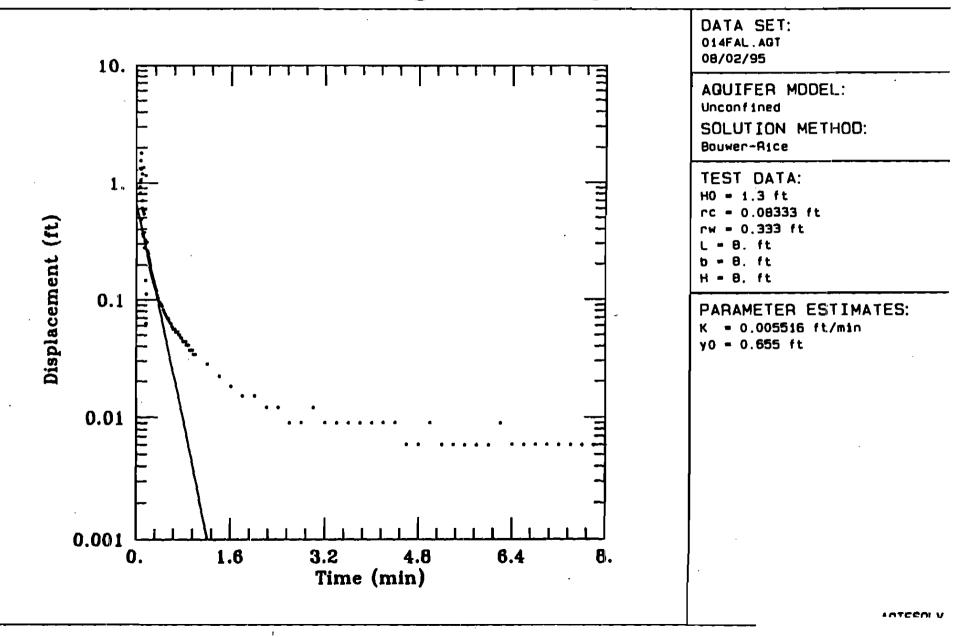
CAN

Rompany: E/A&H

Location: NAS CHARLESTON

Project: 2909-08450

GDI014 Falling Head Slug Test



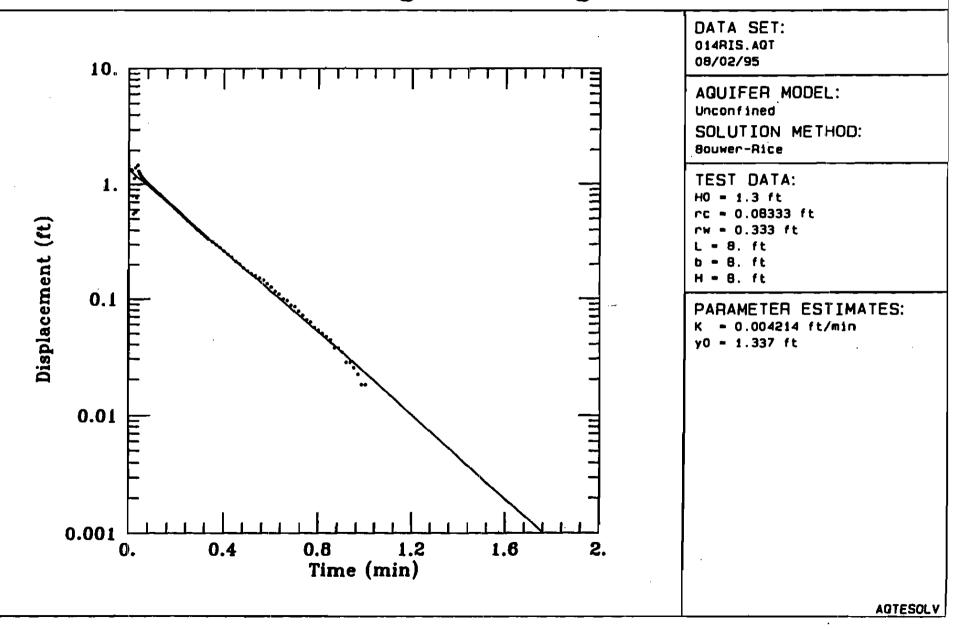
Client: - BAN

Company: E/A&H

Location: NAS CHARLESTON

Project: 2909-08450

GDI014 Rising Head Slug Test



APPENDIX F

RBCA CALCULATIONS

SITE 36, BUILDING NS26 ZONE I CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

HYDROCARBON CONSTITUENT CONCENTRATIONS IN WATER BASED ON RAOULT'S LAW

Parameter Descriptions:	Units
C _w = Aqueous Solubility of Organic Constituents Dissolved from Product	mg/L
C _F = Concentration of the Constituent in the Fuel Oil	mg/L
K _{FW} = Fuel/Water Partition Coefficient	mg/ c
P _c = Density of Fuel Oil	g/mL
MW _F = Molecular Weight of Fuel Oil	g/mol
C _{SAT} = Aqueous Solubility of the Pure Phase Constituent	mol/L
MW _C = Molecular Weight of the Constituent	g/mol
$K_{FW} = (10^3 \text{(mL/L) p}_f)/(MW_f^*C_{SAT}/(1000^*MW_c))$	g/mor
$C_W = C_F/K_{FW}$	mg/L
Source: "Solubility, Sorption, and Transport of Hydrophobic Organic Chemicals in Complex Mixtures," EPA Environmental Research Brief, EPA/600/M-91/009, Robert S. Kerr Environmental Research Laboratory, ADA, Oklahoma. Source: "CONCAWE 1996 Diesel Fuel/Kerosene" Conoco, Inc., Houston Texas	
Key Assumptions:	
MW _F : Molecular Weight of Kerosene, Source: "CONCAWE 1996 Diesel Fuel/Kerosene" Conaco Inc., Houston Texas.	170 g/mol
$P_{\rm F}$: Density of the Product, Source: Conoco Material Safety Data Sheet for Diesel fuel/ Kerosene	0.88 g/mL

Concentration of Chemical Constituents in Water Based on Molar Solubility

Constituent	MW _F	C _{SAT} mg/L	MW _c	P _F	K _{FW}	C _f mg/l	C _W mg/L
				- 3 ,			
Benzene	170.00	1,750	78	0.88	230.72	72.16	0.313
Toluene	170.00	535	92	0.88	890.16	4,136.00	4.646
Ethylbenzene	170.00	152	106	0.88	3609.91	378.40	0.105
Xylene	170.00	198	106	0.88	2771.24	2,200.00	0.794
Napthalene	170.00	40	128.16	0.88	16585.41	387,200.00	23.346

Prepared By:	Reviewed Bv:	

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SITE 36, BUILDING NS26

ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 10-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units	Parameter Descriptions:	Units
POE = Point of Exposure		ρ _s = Sail Bulk Density	g/cm³
SSTL = Site-Specific Target Level	mg/L	foc = Fraction Organic Carbon in Soil	g-C/g-soil
SSTL _{SOURCE} = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L	α_X = Longitudinal Dispersivity = $x/10$	m
SSTL _{COMP} = Hydrocarban Concentration at Compliance Point protective of RBSLs at POE	mg/L	$\alpha_{\rm Y}$ = Transverse Dispersivity = $\alpha_{\rm X}/3$	m
$X_{POE} = x = Distance from Plume Source to POE (along Centerline)$	m	α_z = Vertical Dispersivity = $\alpha_x/20$	m
$X_{COMP} = x = Distance$ from POE to Compliance Point (along Centerline)	m	k _{OC} = Organic Carbon Partition Coefficient	cm³-H ₂ O/g-C
Y = Source Width (Perpendicular to Flow Direction)	m	k _p = Sail-Water Sorption Coefficient	cm3-H2O/g-soil
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m	V = Pore Water Velocity	m/sec
K _s = Saturated Hydraulic Conductivity	m/sec	R _C = Constituent Retardation Factor	
i = Groundwater Gradient	cm/cm	$V/R_C = Maximum Transport Rate of Dissolved Constituent = (K_si)/(\theta R_C)$	m/sec
θ = Porosity in Saturated Zone	cm³/cm³	RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X _{POE}	X _{POE}	Υ	Z	t	Ks	i	θ	ρς	$\alpha_{\mathbf{X}}$	αγ	αΖ	foc	k _{oc}	k _D	V	R _C	C _{POE} /C _{SOURCE}
	ff	m	m	m	sec	m/sec	m/m	:m³/cm	ıg/cm³	m	m	m	g-C/g-soil	cm ³ -H ₂ O/g-C	cm³-H ₂ O/g-soil	m/sec		
Benzene	220	67.05682	7.62	0.91	3.15E+08	2.45E-05	0.0071	0.2	1.2	6.71	2.24	0.34	2.84E-03	81	0.23004	8.70E-07	2.380	1.673E-02
Toluene	61	18.59303	7.62	0.91	3.15E+08	2.45E-05	0.0071	0.2	1.2	1.86	0.62	0.09	2.84E-03	133	0.37772	8.70E-07	3.266	2.150E-01
Ethylbenzene	1	0.304804	7.62	0.91	3.15E+08	2.45E-05	0.0071	0.2	1.2	0.03	0.01	0.00	2.84E-03	176	0.49984	8.70E-07	3.999	1.000E+00
Xylenes	1	0.304804	7.62	0.91	3.15E+08	2.45E-05	0.0071	0.2	1.2	0.03	0.01	0.00	2.84E-03	639	1.81476	8.70E-07	11.889	1.000E+00
Naphihalene	99	30.17557	7.62	0.91	3.15E+08	2.45E-05	0.0071	0.2	1.2	3.02	1.01	0.15	2.84E-03	1543	4.38212	8.70E-07	27.293	4.339E-04

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. Risk-Based Corrective Action for Petroleum Releases, Bureou of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfc \left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X} \frac{vt}{R_c}} \right] \times erf \left[\frac{Y}{4\sqrt{\alpha_Y x}} \right] \times erf \left[\frac{Z}{2\sqrt{\alpha_Z x}} \right]$$

Constituent	C _{SOURCE}	C _x	C _{RBSL}
	mg/L	mg/L	mg/L
Benzene	0.313	0.005	0.005
Toluene	4.646	0.999	1.000
Ethylbenzene	0.105	0.105	0.700
Xylenes	0.794	0.794	10.000
Naphthalene	23.346	0.010	0.010

Prepared B	v:	

SITE36, BUILDING NS26, ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted Time Period to Reach Equilibrium in Groundwater

Parameter Descriptions:	Units	Parameter Descriptions:	Units
POE = Point of Exposure		ρ_{S} = Soil Bulk Density	g/cm³
SSTL = Site-Specific Target Level	mg/L	foc = Fraction Organic Carbon in Soil	g-C/g-soil
SSTL _{SOURCE} = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L	α_X = Longitudinal Dispersivity = x/10	m
SSTL _{COMP} = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L	$\alpha_{\rm Y}$ = Transverse Dispersivity = $\alpha_{\rm X}/3$	m
$X_{POE} = x = Distance$ from Plume Source to POE (along Centerline)	m	α_z = Vertical Dispersivity = $\alpha_x/20$	m
$X_{COMP} = x = Distance$ from POE to Compliance Point (along Centerline)	m	k _{OC} = Organic Carbon Partition Coefficient	cm³-H₂O/g-C
Y = Source Width (Perpendicular ta Flaw Direction)	m	k _D = Sail-Water Sorptian Coefficient	cm³-H₂O/g- s oil
Z = Source Depth (Perpendicular ta Flaw Direction in Vertical Plane)	m	V = Pare Water Velocity	m/sec
K _S ≈ Saturated Hydrautic Canductivity	m/sec	R _C = Constituent Relardation Factor	
i = Groundwater Gradient	cm/cm	$V/R_C = Maximum Transport Rate at Dissalved Constituent = (K_i)/(\theta R_C)$	m/sec
θ = Porosity in Saturated Zane	cm³/cm³	RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	XPOE	XPOE	Υ	Z	t	Ks	i	θ	ρs	$\alpha_{\mathbf{X}}$	α_{Y}	α_{Z}	foc	k _{oc}	k _D	V	R_{C}	C _{POE} /C _{SOURCE}
()	ft	m	m	m	sec	m/sec	m/m	:m³/cn	ıg/cm³	m	m	m	g-C/g-soil	cm ³ -H ₂ O/g-C	cm³-H₂O/g-soil	m/sec		
Benzene	230	70.10485	7.62	0.91	3.15E+08	2.45E-05	0.0071	0.2	1.2	7.01	2.34	0.35	2.84E-03	81	0.23004	8.70E-07	2.380	1.497E-02
Toluene	61	18.59303	7.62	0.91	2.84E+08	2.45E-05	0.0071	0.2	1.2	1.86	0.62	0.09	2.84E-03	133	0.37772	8.70E-07	3.266	2.149E-01
Ethylbenzene	1	0.304804	7.62	0.91	3.15E+07	2.45E-05	0.0071	0.2	1.2	0.03	0.01	0.00	2.84E-03	176	0.49984	8.70E-07	3.999	1.000E+00
Xylenes	1	0.304804	7.62	0.91	3.15E+07	2.45E-05	0.0071	0.2	1.2	0.03	0.01	0.00	2.84E-03	649	1.84316	8.70E-07	12.059	1.000E+00
Naphthalene	170	51.81663	7.62	0.91	6.28E+08	2.45E-05	0.0071	0.2	1.2	5.18	1.73	0.26	2.84E-03	1543	4.38212	8.70E-07	27.293	4.234E-04

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. Risk-Based Corrective Action for Petroleum Releases, Bureau of Undergraund Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfo \left[\frac{\left(x - \frac{vt}{R_c}\right)}{2\sqrt{\alpha_X \frac{vt}{R_c}}} \right] \times erf \left[\frac{Y}{4\sqrt{\alpha_Y x}} \right] \times erf \left[\frac{Z}{2\sqrt{\alpha_Z x}} \right]$$

Constituent	C _{source} mg/L	C _X mg/L	RBSL mg/L
Benzene	0.313	0.005	0.005
Toluene	4.646	0.999	1.000
Ethylbenzene	0.105	0.105	0.700
Xylenes	0.794	0.794	10.000
Naphthalene	23.346	0.010	0.010

	lime to Steady State
L	years
L	
-	10.0
-	9.0
	1.0
	1.0
	19.9

repared By:	

SITE 36, BUILDING NS26

ZONE I, CHARLESTON NAVAL COMPLEX NORTH CHARLESTON, SOUTH CAROLINA

DOMENICO'S DILUTION/ATTENUATION EQUATION FOR GROUNDWATER TRANSPORT

Predicted 20-year Migration of Constituents in Groundwater

Parameter Descriptions:	Units	Parameter Descriptions:	Units
POE = Point of Exposure		ρ _S = Soil Bulk Density	g/cm³
SSTL = Site-Specific Target Level	mg/L	foc = Fraction Organic Carbon in Soil	g-C/g-soil
SSTL _{SOURCE} = Hydrocarbon Concentration in Plume Source Area protective of RBSLs at POE	mg/L	α_x = Longitudinal Dispersivity = x/10	m
SSTL _{COMP} = Hydrocarbon Concentration at Compliance Point protective of RBSLs at POE	mg/L	$\alpha_{\rm Y}$ = Transverse Dispersivity = $\alpha_{\rm X}/3$	m
$X_{POE} = x = Distance$ from Plume Source to POE (along Centerline)	m	α_l = Vertical Dispersivity = $\alpha_x/20$	m
$X_{COMP} = x = Distance from POE to Compliance Point (along Centerline)$	m	k _{oc} = Organic Carbon Partition Coefficient	cm³-H₂O/g-C
Y = Source Width (Perpendicular to Flow Direction)	m	k _D = Soil-Water Sorption Coefficient	cm ³ -H ₂ O/g-soil
Z = Source Depth (Perpendicular to Flow Direction in Vertical Plane)	m	V = Pore Water Velocity	m/sec
K _s = Saturated Hydraulic Conductivity	m/sec	R _C = Constituent Retardation Factor	
i = Groundwater Gradient	cm/cm	$V/R_C = Maximum Transport Rate of Dissalved Constituent = (K_i)/(eR_C)$	m/sec
θ = Porosity in Saturated Zone	cm³/cm³	RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

Dilution & Attenuation without Biological Decay

Constituent	X _{POE}	X _{POE}	Υ	Z	t	Ks	i	θ	ρς	$\alpha_{\mathbf{X}}$	αγ	α_{Z}	foc	k _{oc}	k _D		R _C	C _{POE} /C _{SOURCE}
إر	ff	m	m	m	sec	m/sec	m/m	:m³/cm	g/cm³	m	m	m	g-C/g-soil	cm³-H₂O/g-C	cm³-H ₂ O/g-soil	m/sec		
enzene	230	70.10485	7.62	0.91	6.31E+08	2.45E-05	0.0071	0.2	1.2	7.01	2.34	0.35	2.84E-03	81	0.23004	8.70E-07	2.380	1.718E-02
Toluene	61	18.59303	7.62	0.91	6.31E+08	2.45E-05	0.0071	0.2	1,2	1.86	0.62	0.09	2.84E-03	133	0.37772	8.70E-07	3.266	2.150E-01
Ethylbenzene	1	0.304804	7.62	0.91	6.31E+08	2.45E-05	0.0071	0.2	1.2	0.03	0.01	0.00	2.84E-03	176	0.49984	8.70E-07	3.999	1.000E+00
Xylenes	1	0.304804	7.62	0.91	6.31E+08	2.45E-05	0.0071	0.2	1.2	0.03	0.01	0.00	2.84E-03	639	1.81476	8.70E-07	11.889	1.000E+00
Naphthalene	170	51.81663	7.62	0.91	6.31E+08	2.45E-05	0.0071	0.2	1.2	5.18	1.73	0.26	2.84E-03	1543	4.38212	8.70E-07	27.293	4.372E-04

Source: South Carolina Department of Health and Environmental Control (SCDHEC) 1998. Risk-Based Corrective Action for Petroleum Releases, Bureau of Underground Storage Tank Management.

DOMENICO DILUTION/ATTENUATION MODEL WITHOUT BIOLOGICAL DECAY

$\frac{C_X}{C_{SOURCE}} = \frac{1}{2} erfo$	$ \begin{cases} \left(x - \frac{vt}{R_c}\right) \\ 2\sqrt{\alpha_x \frac{vt}{R_c}} \end{cases} $	$\left \times erf \left[\frac{Y}{4\sqrt{\alpha_{\gamma}x}} \right] \right $	$\times erf \left[\frac{Z}{2\sqrt{\alpha_z x}} \right]$
---	--	---	--

Constituent	C _{SOURCE} mg/L	C _x mg/L	C _{RBSL} mg/L		
Benzene	0.313	0.005	0.005		
Toluene	4.646	0.999	1.000		
Ethylbenzene	0.105	0.105	0.700		
Xylenes	0.794	0.794	10.000		
Naphthalene	23.346	0.010	0.010		

Prepared By:	

Reviewed By: _		
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Site Specific Target Level Calculations for Soil: Construction Worker Inhalation of Volatiles from Soil

Parameter Descriptions:	Units	Porameter Descriptions:	Units		
ABS = Absorption Fraction		ET = Exposure Time	hours/day		
AF = Adherence Factor of Soil to Skin	mg/cm ²	FI = Fraction Ingested			
AT = Averaging Time	days	HQ = Hazard Quotient			
BW = Body Weight	kg	IR = Inhalation or Ingestion Rate m ³ /t			
CF = Conversion Factor	-	RBSL = Risk Based Sceeening Level			
CSF _D = Dermal Cancer Slope Factor	(mg/kg-day) ⁻¹	RfD _D = Dermal Reference Dose	mg/kg-day		
CSF ₁ = Inhalation Cancer Slope Factor	(mg/kg-day) ⁻¹	RfD ₁ = Inhalation Reference Dose	mg/kg-day		
CSF _O = Oral Cancer Slope Factor	(mg/kg-day) ⁻¹	RfD _O = Oral Reference Dose	mg/kg-day		
ED = Exposure Duration year		SA =Skin Surface Area Available for Contact cm ²			
EF = Exposure Frequency	days/year	VF _{SS} = Volatilization Factor			
FLCR = Excess Lifetime Concer Risk	• •				

Construction Worker Inholation of Vapor from Soil (Outdoor)

Constituent	IR _	ET _	EF	ED	AT	BW
	m³/hour	hours/day	days/year	years	days	kg
Benzene	0.83	8	90	1	25550	70
Napthalene	0.83	8	90	1	87.6	70

Constituent	CSF ₁	RfD _i	Target ELCR	Target HQ	RBSL _{AIR}	VF _{SS}	RB\$L _{SOIL}
	(mg/kg- day) ⁻¹	mg/kg- day			mg/m³	mg/m³ / mg/kg	mg/kg
Benzene	0.029	NA	1.0E-06	NA	0.1027874	1.31E-05	7,853
Napthalene	NA	0.004	NA	1.0E+00	0.04088	1.31E-05	3,123

Source: ASTM (American Society for Testing and Materials), 1997. Standard Guide for Risk-Based Corrective Action applied at Petroleum Release Sites: E 1739 - 95E1, Annual Book of ASTM Standards, West Constrohocken, PA

Construction Worker Dermal RBSLs

" -	Kow	MW	Кр	В	$ au_{event}$	С	b	t*	t _{event}	DAevent
			cm/hr	unitless	hr/event			hr	hr/event	
Benzene	199.5262315	78.1	0.11551543	0.392637855	2.87E-01	6.32E-01	6.03E-01	6.90E-01	1	eq 3.3
Toluene	537.0317964	92.1	0.259561335	0.958068292	3.44E-01	1.13E+00	1.31E+00	1.33E+00	1	eq 3.2
Ethylbenzene	1412.537545	106.2	0.569219802	2.256154884	4.13E-01	2.36E+00	4.39E+00	1.70E+00	1	eq 3.2
Xylene*	1584.893192	106.2	0.638675123	2.531447415	4.13E-01	2.63E+00	5.31E+00	1.72E+00	1	eq 3.2
Naphthalene	1995.262315	128.2	0.605452393	2.636638957	5.48E-01	2,73E+00	5.69E+00	2.29E+00	1	eq 3.2

	BW	AT	E:V	ED	EF	SA	CSF derm	Rfd derm	Target	RBSL	RBSL
	kg	day	events/day	yrs	days/yr	cm ²	(mg/kg-day) ⁻¹	mg/kg-day	Risk or HQ	mg/L	mg/L
Benzene	70	25550	1	1	90	4500	2.99E-02	NA	1.00E-06		8.52E-01
Toluene	70	365	1	1	90	4500	NA	1.60E-01	1.0	2.40E+01	
Ethylbenzene	70	365	1	1	90	4500	NA	9.70E-02	1.0	6.05E+00	
Xylene*	70	365	1	1	90	4500	NA	1.84E+00	1.0	1.02E+02	Ĺ
Naphthalene	70	365	1	1	90	4500	NA	3.20E-02	1.0	1.63E+00	

^{*} Kow and MW values for xylene, m-

Prepared By:	Reviewed By:
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Construction Worker Incidental Ingestion RBSLs

	BW	AT	IR	ED	EF	Target	CSF oral	Rfd oral	RB\$L
	kg	day	L/day_	yrs	days/yr	Risk or HQ		_	mg/L
Benzene	70	25550	0.01	1	90	1,00E-06	2.90E-02		6.85E+01
Toluene	70	365	0.01	1	90	1.0	NA	2.00E-01	5677.778
Ethylbenzene	70	365	0.01	1	90	1.0	NA	1.00E-01	2838.889
Xylene	70	365	0.01	1	90	1.0	NA	2.00E+00	56777.78
Naphthalene	70	365	0.01	1	90	1.0	NA	4.00E-02	1135.556

Prepared By:	Deviewa de Dec
Prepared BV:	Reviewed By:
. repared by:	1101101101

Construction Worker Inhalation RBSLs

Chemical	Dair	Dwater	Н	θακαρ	θ _{weap}	θ _{os} _	θ _{ws}	θτ	Deff-cap	Deff-s
	cm²/s	cm²/s	cm³/cm³	cm³/cm³	cm³/cm³	cm³/cm³	cm ³ /cm ³	cm³/cm³	crn ² /s	cm²/s
Benzene	0.093	1.10E-05	2.26E-01	0.038	0.342	0.33	0.15	0.48	1.35E-05	1.01E-02
Toluene	0.085	9.40E-06	3.01E-01	0.038	0.342	0.33	0.15	0.48	1.07E-05	9.20E-03
Ethylbenzene	0.076	8.50E-06	2.80E-01	0.038	0.342	0.33	0.15	0.48	9.85E-06	8.22E-03
Xylenes	0.072	8.50E-06	2.78E-01	0.038	0.342	0.33	0.15	0.48	9.55E-06	7.79E-03
Naphthalene	0.072	9.40E-06	2.00E-03	0.038	0.342	0.33	0.15	0.48	5.79E-04	7.83E-03

Chemical		hcap	hv	Deff-ws	Uair	δair	Lgw	W	VFwamb	TR (carc)	HI (nonc)
		cm	cm	cm²/s	cm/sec	cm	cm	cm	mg/m³/mg/L		
Benzene	T	5	117	3.18E-04	225	200	122_	1500	1.97E-05	1.00E-06	NA
Toluene		5	117	2.54E-04	225	200	122	1500	2.09E-05	NA	1
Ethylbenzene		5	117	2.34E-04	225	200	122	1500	1.79E-05	NA	1
Xylenes		5	117	2.27E-04	225	200	122_	1500	1.72E-05	NA	1
Naphthalene		5	117	5.17E-03	225	200	122	1500	2.83E-06	NA	1

Chemical	TR (carc)	HI (nonc)	BWadult	AT	Sfi (carc)	RfD (nonc)	IR air	EF	ED	RBSLair	Н	RBSLwater
			kg	yr	[mg/kg-day] ⁻¹	[mg/kg-day]	m³/day	day/ <u>yr</u>	yr _	mg/m³	cm³/cm³	mg/L
Benzene	1.00E-06	NA	70	70	2.90E-02	NA	20	90	1	3.43E-02	2.26E-01	0.15
Toluene	NA	1	70	1	NA	1.14E-01	20	90	1	1.62E+00	3.01E-01	5.38
Ethylbenzene	NA	1	70	1	NA	2.86E-01	20	90	1	4.06E+00	2.80E-01	14.50
Xylenes	NA	1	70	1	NA	NA*	20	90	1	NA*	2.78E-01	NA*
Naphthalene	NA	1	70	1	NA	3.71E-04	20	90	1	5.27E-03	2.00E-03	2.63

^{*}No inhalation reference dose is available for xylenes; therefore, no RBSL can be calculated for xylene.

repared By:	Reviewed By:

Minimum Construction Worker RBSLs

	Dermal	Incidental Ingestion	Inhalation	Minimum	
	RBSL	RBSL	RBSL	RBSL	
	rng/L	mg/L	mg/L	mcၘ/L	
Benzene	0.85	68.52	0.15	0.15	
Toluene	23.98	5677.78	5.38	5.38	
Ethylbenzene	6.05	2838.89	14.50	6.05	
Xylene	102.33	56777.78	NA*	102.33	
Naphthalene	1.63	1135.56	2.63	1.63	

^{*}No inhalation reference dose is available for xylenes; therefore, no inhalation RBSL can be calculated.

Prepared By:	Reviewed By:

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA

Department of Health and Environmental Control (DHEC)

Site Data

SITE ID # COUNTY Columbia

FACILITY NAME Site 36, Building NS26

STREET ADDRESS Charleston Naval Complex, North Charleston, SC

Soil Risk Evaluation Data

				<u>Fiqure</u>
TPH		878_ mg/kg		
Soil % SAND (Estim	nated)	46.6 %		
Soil % CLAY (Estim	ated)	5.4 %		
Worst Case	Benzene	1.6 mg/kg	Cs	
Soil Analyses	Toluene	0 mg/kg	Cs	
•	Ethylbenzene	0 mg/kg	Cs	
	Xylenes	0 mg/kg	Cs	
	Naphthalene	48 mg/kg	Cs	
	MTBE	0 mg/kg	Cs	
Natural Organic Car	bon Content	2840 mg/kg	foc	
Average Annual Red	charge	25 cm	Hw	
Distance from highe	st Soil			
Impact to water table	e	<u>61</u> cm	L	
Bulk Density of Soil		1.2 g/cc	Bd	1
Wetting Front Suction	on	-17 cm	Hf	2
Soil Hydraulic Cond	uctivity	6.00E-04 cm/sec	Kf	3
Porosity	•	0.54 decimal %	Φ	4
Residual Water Con	tent	0.038 decimal %	Wr	5

List possible human exposure pathways from surface soil.

Soil leaching to groundwater - construction worker exposure

IN-SITU SOIL RISK EVALUATION

SOIL LEACHABILITY MODEL FOR BENZENE RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site: Site 36, Building NS26
Location: Charleston Naval Complex, North Charleston, SC

REFERENCES;

- (1) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 1.
- (2) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 2.
- (3) SCDHEC, RBCA Far Petroleum Releases, June 1995, Appendix B, Input Parameters.
- (4) SCDHEC, RBCA Far Petroleum Releases, June 1995, Appendix B, Table 1.
- (5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
- (6) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 3.
- (7) SCDHEC, RBCA Far Petroleum Releases, June 1995, Appendix B, Figure 4.
- (8) SCDHEC, RBCA Far Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC Chemical of Concern		BENZENE
Bd Soil Bulk Density (1)	g/cm3	1.2
Crsbl Risk Based Screening Level	mg/L	0.15
Cs Concentration of COC in soil	mg/kg	1.6
DAF Dilution/Attenuation Factor (2)	unitless	8
foc Organic Carbon Content in Soil (3)	mg/kg	2840
H' Henry's Low Constant (4)	unitless	0.23
Hf Wetting front suction head (always negative) (5)	cm	-17
Hw Average Annual Recharge (3)	cm	25.00
Kf Soil Hydraulic Conductivity (6)	cm/s	6.00E-04
Koc Soil/Water Partioning Coefficient (2)	ml/g	81
L Depth between soil sample with greatest COC concentration to groundwater.	cm	61
Φ Porosity (7)	unitless	0.54
t1/2 Biodegradotion "half life" (2)	doys	16
TPH Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	878
Wr Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine soil pore water concentration resulting from physical portioning (Cw).

Step 1 - Colculate the total organic carbon content (fcs) of the soil.

 $fcs = (foc + TPH/1.724)^*1E-6 = 0.0033$ decimal %

Step 2 - Colculate the concentration of COC in soil pore water (Cw) directly in contact with the contominate soil.

 $C_W = C_s^*((W_f^*lg/cc+Bd)/((Bd^*Koc^*fcs)+W_f+((Ø-W_f)^*H'))) = 4.1526$ mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled parosity (f) in decimal percent.

f = Ø - Wr = 0.50 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of worst case soil sample to the water toble at site).

 $t = (f/Kf)^*(L-((Hw-Hf)^*(In((Hw+L-Hf)/(Hw-Hf))))) = 19,514$ seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 3,231 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 0.23004 ml/g

Step 2 - Calculate the retardation effect of natural soil organic matter on COC migration.

Vc = Vw/(1+((Bd*Kd)/Ø)) = 2,138 ft/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concern.

Step 1 - Calculate the time (Tc) in days required for the COC to reach groundwater.

 $Tc = 365 \,day/yr^*((L/30.48cm/ff)/Vc) = 0.34 \,days$

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

 $Cp = 10^{(log (Crsbl)+((Tc/2.3)^{(0.693/t1/2)))} = 0.1522$ mg/l

COC concentration in soil pore water (Cw) is less than concentration necessary to protect groundwater (Cp). Not necessary to calculate SSTL

Equation Set V - Calculate the Site Specific Target Level (SSTL) far the COC in	soil.
---	-------

	Css11 for	BENZENE in soil	= Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr*1g/cc+Bd)):0.469253	mg/kg
PREPARED BY	Y:		Date	
CHECKED BY	/ :		Date	

IN-SIT	U SOIL RISK EVAL	UATION				
Department of H	SOUTH CAROLINA lealth and Environment	al Control (D	HEC)			
Site Data						
SITE ID # FACILITY NAME Site 36, Building NS26			_			
Instructions						
Provide results, separately, for each const	ituent in the worst case	soil analysis	i.			
Data						
List Constituent: BENZENE						
(BTEX, Napth.)	_					Table
Bioremediation "half-life"	16	days	t 1/2			1
Soil/water partitioning coefficient	81	ml/g	K oc			1
Kesults			-			
				Equation Set	Step	
Total Organic Carbon Content	0.0033	decimal %	f cs	Jei	1	
Leachate Concentration	4.153		Cw	i	2	
Air Filled Porosity		decimal %	f	H	1	
Infiltration Rate Time	19,514	seconds	t	11	2	
Velocity of Water	3,231	ft/year	V w	Ħ	3	
Soil/Water Distribution Coefficient	0.2300	. •	Κd	III	1	
Contaminant Percolation Rate		ft/year	V c		2	
Time to Reach Groundwater		days	Тc	IV	1	
Concentration reaching Groundwater	0.1522 0.4693	. •	C p C sstl	IV V	2	
Site Specific Target Level	0.4053	ilig/kg	C 55II	V		
Conclusions						
Does concentration of chemical of concern	in soil exceed SSTL?			YES		
				-120		
Risk of Human Exposure due to contamina X	ated soil. _ YES			_NO		
IN-SIT	U SOIL RISK EVAL	UATION				

SOIL LEACHABILITY MODEL FOR NAPHTHALENE RISK-BASED CORRECTIVE ACTION FOR PETROLEUM RELEASES

SITE INFORMATION:

Site: Site 36, Building NS26
Location: Charleston Naval Complex, North Charleston, SC

REFERENCES:

- (1) SCDHEC, RBCA for Petroleum Releases, June 1995, Appendix B, Figure 1.
- (2) SCDHEC, RBCA for Petroleum Releases, June 1995, Appendix B, Table 2.
- (3) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Input Porameters.
- (4) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Table 1.
- (5) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 2.
- (6) SCDHEC, RBCA For Petroleum Releoses, June 1995, Appendix B, Figure 3.
- (7) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 4.
- (8) SCDHEC, RBCA For Petroleum Releases, June 1995, Appendix B, Figure 5.

INPUT:

COC Chemical of Concern		NAPHTHALENE
Bd Soil Bulk Density (1)	g/cm3_	1.2
Crsbl Risk Based Screening Level	mg/L	1.63
Cs Concentration of COC in soil	mg/kg	48
DAF Dilution/Attenuation Factor (2)	unitless	8
foc Organic Carbon Content in Soil (3)	mg/kg	2840
H' Henry's Law Constant (4)	unitless	0.00
Hf Wetting front suction head (always negative) (5)	cm ⁻	-17
Hw Average Annual Recharge (3)	cm	25
Kf Soil Hydraulic Conductivity (6)	cm/s	0.0006
Koc Soil/Water Partioning Coefficient (2)	ml/g	1543
L Depth between soil sample with greatest COC concentration to groundwater.	cm	61
Ø Porosity (7)	unitless	0.54
11/2 Biodegradation "half life" (2)	days	48
TPH Total Petroleum Hydrocarbons, EPA Method 3550	mg/kg	878
Wr Residual Water Content (8)	volume fraction	0.04

CALCULATIONS:

Equation Set I - Determine sail pare water cancentration resulting from physical partianing (Cw).

Step 1 - Colculate the total organic carbon content (fcs) of the soil.

fcs = (foc +TPH/1.724)*1E-6 = 0.0033 decimal %

Step 2 - Calculate the cancentration of COC in sail pore water (Cw) directly in contact with the contaminate soil.

 $Cw = Cs^*((Wr^*]g/cc+Bd)/((Bd^*Koc^*fcs)+Wr+((Ø-Wr)^*H'))) = 0.35$ mg/l

Equation Set II - Determine the velocity of the soil pore water (Vw)

Step 1 - Calculate the air filled porosity (f) in decimal percent.

f = Ø - Wr = 0.50 decimal %

Step 2 - Determine the time for water to percolate through the vadose zone soil (from depth of warst case soil sample to the water table at site).

 $t = (f/Kf)^*(L-(Hw-Hf))^*(In(Hw+((L-Hf)/(Hw-Hf)))) = 19,514$ seconds

Step 3 - Determine the velocity of the water (Vw) in feet per year.

Vw = (L/30.48cm/ft)/(t/31,500,000sec/year) = 3231 ft/year

Equation Set III - Determine the organic retardation effect (Vc) of the contaminant.

Step 1 - Calculate the soil/water distribution coefficient (Kd) (ml/g) for uncontaminated soil.

Kd = Koc*foc*1E-6 = 4.38212 ml/g

Step 2 - Calculate the retardation effect of natural sail organic motter on COC migration.

 $Vc = Vw^*(1+((Bd^*Kd)/Ø)) = 301$ ff/year

Equation Set IV - Determine biodegradation rates and provide final COC concentration (Cf) at depth of concentration (Cf) at

Step 1 - Colculate the time (Tc) in days required for the COC to reoch groundwater.

 $Tc = 365 \text{ day/yr}^{(L/30.48cm/ff)/Vc} = 2.43$ days

Step 2 - Calculate estimated concentration of COC in the soil pore water (Cp) necessary to protect groundwater.

 $Cp = 10^{(log (Crsbl)+((Tc/2.3)^{*}(0.693/t1/2)))} = 1.69$ mg/l

COC concentration in soil pore water (Cp) is greater than Crsbl, therefore the SSTL must be calculated.

Equation Set V - Calculate the Site Specific Target Level (SSTL) for the COC in soil.

Csstl for VAPHTHALENE

= Cp*DAF*(((Bd*Koc*fcs)+Wr+(F*'H'''))/(Wr*1g/cc+Bd)) = 68.080029 mg/kg

in soil

PREPARED BY:

Date

CHECKED 8Y:__

Date

IN-SITU SOIL RISK EVALUATION

SOUTH CAROLINA Department of Health and Environmental Control (DHEC)									
Site Data									
SITE ID # FACILITY NAME Site 36, Building NS26		_							
Instructions									
Provide results, separately, for each const	ituent in the worst case s	oil analys	sis.						
Data				_					
List Constituent: NAPHTHALENE (BTEX, Napth.) Bioremediation "half-life" Soil/water partitioning coefficient	48days 1543ml/g	t 1/2 K oc			Table 1 1				
Results									
Total Organic Carbon Content Leachate Concentration Air Filled Porosity Infiltration Rate Time Velocity of Water Soil/Water Distribution Coefficient Contaminant Percolation Rate Time to Reach Groundwater Concentration reaching Groundwater Site Specific Target Level	0.0033 decimal % 0.351 mg/l 0.50 decimal % 19,514 seconds 3,231 ft/year 4.38 ml/g 301 ft/year 2 days 1.69 mg/l 68 mg/kg	f cs C w f t V w K d V c T c C p C sstl	Equation Set I II II III IV V	Step 1 2 1 2 3 1 2 1 2					
Does concentration of chemical of concern		X	NO NO						
IN-SITU SC	DIL RISK EVALUATION			_					

of Groundwater Discharge to the Cooper River

<u>Units</u>	Parameter Descriptions:	Units
	ρ _s = Soil Bulk Density	g/cm³
mg/L	f_{OC} = Fraction Organic Carbon in Soil	g-C/g-soil
mg/L	$\alpha_{\rm X}$ = Longitudinal Dispersivity = 0.2x	m
mg/L	$\alpha_{\rm Y}$ = Transverse Dispersivity = $\alpha_{\rm X}/300$	m
m	α_z = Vertical Dispersivity = 1 x 10 ⁻⁹⁹	m
m	k _{oc} = Organic Carbon Partition Coefficient	cm³-H ₂ O/g-C
m	k _D = Soil-Water Sorption Coefficient	cm³-H₂O/g- so il
m	V = Pore Water Velocity	m/sec
m/sec	R _C = Canstituent Retardation Factor	
:m/cm	$V/R_C = Maximum Transport Rate of Dissolved Constituent = (K_si)/(\theta R_C)$	m/sec
m³/cm³	RBSL = Risk-Based Screening Level in Water Provided by SCDHEC (1998)	mg/L

θ	ρs	$\alpha_{\mathbf{X}}$	α_{Y}	$\alpha_{\mathbf{Z}}$	foc	k _{oc}	k _D	v	R _C	C _{POE} /C _{SOURCE}
n³/cm³	g/cm ³	m	m	m	g-C/g-soil	cm³-H ₂ O/g-0	cm³-H ₂ O/g-soil	m/sec		
0.2	1.2	3.35	1.12	0.17	2.84E-03	81	0.23004	8.70E-07	2.380	7.276E-02
0.2	1.2	3.35	1.12	0.17	2.84E-03	133	0.37772	8.70E-07	3.266	7.276E-02
0.2	1.2	3.35	1.12	0.17	2.84E-03	176	0.49984	8.70E-07	3.999	7.276E-02
0.2	1.2	3.35	1.12	0.17	2.84E-03	639	1.81476	8.70E-07	11.889	7.276E-02
0.2	1.2	3.3\$	1.12	0.17	2.84E-03	1543	4.38212	8.70E-07	27.293	7.276E-02

θ	ρs	α_{X}	αγ	αζ	foc	k _{oc}	k _D	V	R _C	C _{POE} /C _{COMP}
1 ³ /cm ³	g/cm ³	m	m	m	g-C/g-soil	cm³-H₂O/g-C	cm³-H ₂ O/g-soil	m/sec		
0.2	1.2	1.07	0.36	0.05	2.84E-03	81	0.23004	8.70E-07	2,380	5.053E-01
0.2	1.2	1.07	0.36	0.05	2.84E-03	133	0.37772	8.70E-07	3.266	5.053E-01
0.2	1.2	1.07	0.36	0.05	2.84E-03	176	0.49984	8.70E-07	3.999	5.053E-01
0.2	1.2	1.07	0.36	0.05	2.84E-03	639	1.81476	8.70E-07	11.889	5.053E-01
0.2	1.2	1.07	0.36	0.05	2.84E-03	1543	4.38212	8.70E-07	27.293	5.053E-01

ive Action for Petroleum Releases, Bureau of Underground Storage Tank Management.

Constituent	C _{SOURCE} mg/L	SSTL _{SOURCE} mg/L	SSTL _{COMP} mg/L	POE RBSL mg/L
Benzene	0.313	0.069	0.010	0.005
Toluene	4.646	13.7	2.0	1.000
Ethylbenzene	0.105	9.6	1.4	0.700
Xylenes	0.794	137.4	19.8	10.000